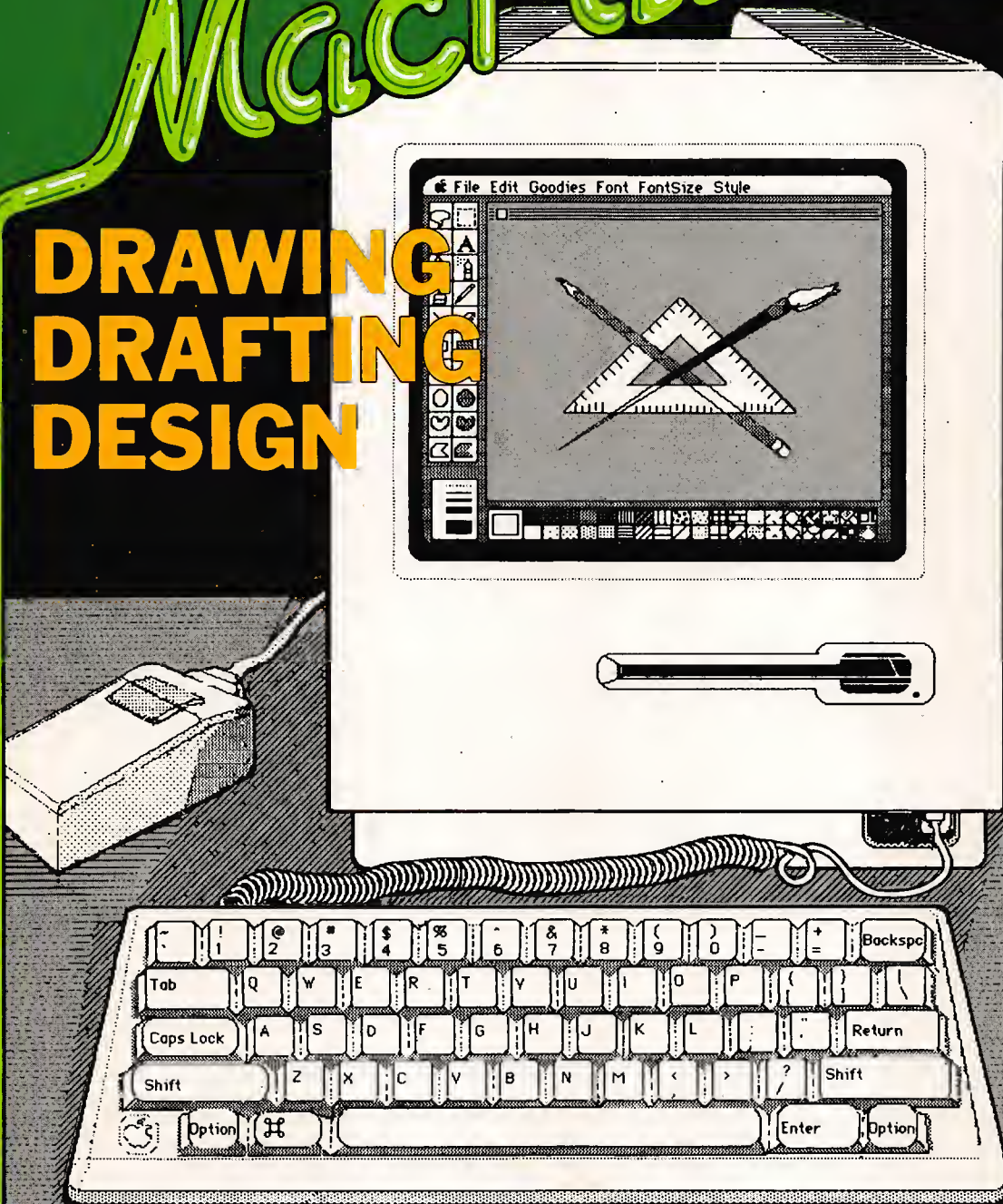


# MacPaint

**DRAWING  
DRAFTING  
DESIGN**



**Brady**

**Susan Schmieman**



**MACPAINT**

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**DRAWING  
DRAFTING  
DESIGN**

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***Susan Schmieman***

Brady Communications Company, Inc.  
A Prentice-Hall Publishing Company  
Bowie, MD 20715

## MacPaint Drawing Drafting Design

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To Sherrie Jean and Ivy Marie,  
with love

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## **About the Author.....**

Susan Schmieman earned the Master of Landscape Architecture degree from Ball State University. Although traditional drawing, drafting, and design courses dominated the curriculum, she was innovative in the application of computers to solving academic problems and in her thesis project. Since graduation, Susan has been self-employed, transmitting her unique knowledge of both computers and design to others through publication in professional journals and presentations before industry meetings. She is the author of CAPS, Computer Augmented Plant Selector program written in UCSD Pascal for Apple computers. The program is being used by universities and government agencies for landscape design and teaching.

Mrs. Schmieman resides with her husband in Silver Spring, Maryland, where they enjoy the many cultural and professional opportunities afforded by proximity to our nation's capital.

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I thank my husband, Eric, for his support and willingness to take risks. Without his ideas and enthusiasm, my interest in computers and landscape architecture would not have developed...

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My admiration and gratitude to both.

*Susan Schmieman  
Maribel, Wisconsin  
1984*

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# Preface

Two artists drawing the same rose would draw two entirely different pictures. Similarly, two artists will approach MacPaint differently, the new computer graphics program developed by Apple Computer, Inc. for the Macintosh personal computer. This manual is intended to give artists and designers a basic understanding of the tools used in MacPaint to create drawings and generate ideas for design projects. For those who like problem solving, the MacPaint program will be doubly enjoyable since there are many ways to create the same artwork in MacPaint. Presented in this manual is one designer's approach, one which will help you quickly develop MacPaint skills as part of the design process.

If you have not gone through the Apple™ Macintosh programs called “A Guided Tour of Macintosh” and “A Guided Tour of MacWrite/MacPaint” (included with each Macintosh and each copy of MacWrite/MacPaint) we suggest you do so before trying the exercises in this book. You will also find the “MacPaint Manual”, included with each copy of the MacPaint program, a useful reference. If these references are not available to you, you can still safely begin with Chapter 1. Experienced Macintosh users will find Chapter 1 a useful review of Macintosh techniques. Or, if you are anxious to start creating graphics, you may begin with Chapter 2.

**Chapter 1** provides the basic definitions and uses of the tools specific to MacPaint. The tools are organized according to the elements of design. Tools used to create line, shape, pattern, and texture are presented first. Functions, such as erasing, cutting, and pasting, follow. The final portion of Chapter 1 presents features unique to MacPaint which make the artist's world more exciting than ever.

**Chapter 2** gives tips on how to work in this new art-computer environment with *control*. The chapter takes you beyond being amazed at the paints and patterns that happen to splash on the screen. *Controlling* the tools and placing lines, shapes, and patterns where you need them is this chapter's emphasis.

**Chapter 3** introduces simple drawings. In this chapter you will begin to combine the techniques you learned in Chapters 1 and 2.

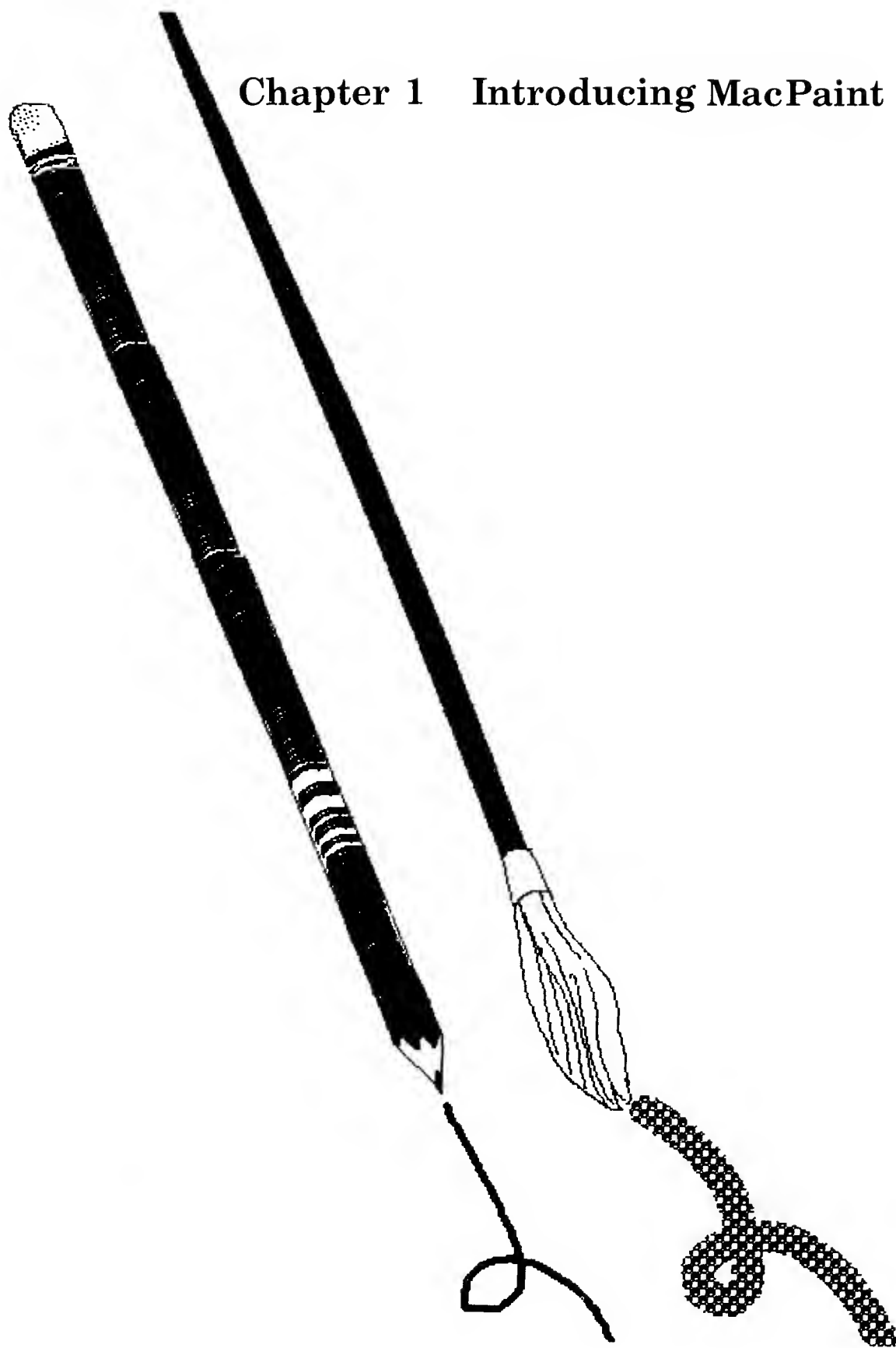
**Chapter 4** presents examples of drawings that might logically be produced in a simple design project. Although the drawings focus on conceptual design of a cottage studio, techniques are introduced that will benefit all MacPaint users. The subject matter selected in the drawings is simply a vehicle for showing advanced MacPaint applications and techniques.

**Chapter 5**, the final chapter, contains information on the printer and ways to present your final graphics in their best form.

There are three typefaces throughout the book: CAPITALIZED PLAIN, **bold**, and outline. Plain capitalized words are the tools or words you will see on the Macintosh screen. Bold type is used to give a specific set of instructions to accomplish a specific task. Outline type refers to the title of a completed drawing in the manual.

Initial draft of this book was created entirely on the Macintosh. All graphics and word processing were created using a Macintosh system which included a 128K memory Macintosh computer with the keyboard and mouse, an Imagewriter printer, and only one internal disk drive that comes with each Macintosh. An additional external disk drive will substantially speed up graphics work and make saving and retrieving partially completed drawings much simpler. So here's to your explorations through MacPaint!

## Chapter 1 Introducing MacPaint



In the past, computer graphics capabilities have been available only to large corporations with expensive CAD/CAM (computer aided design/computer aided manufacturing) systems. For the first time a graphics computer system, the Macintosh, is available for the small design firm and design enthusiast. Not only is the price affordable to more designers but the computer with its graphics and word processing software, MacPaint and MacWrite, are infectiously fun to use. The human engineering considerations of Apple Computer's designers and engineers have made the Macintosh system enjoyable as well as productive. Fun and production can only lead to greater creativity! This is a breakthrough for all artists, designers, and hobbyists.

This chapter introduces MacPaint terminology and provides basic instructions in the use of each MacPaint tool. After reading this chapter and reproducing the screen illustrations on your Macintosh, you will be able to produce many drawings using the MacPaint tools. You will also be prepared for more advanced discussions on how to move around MacPaint's environment efficiently while creating drawings quickly.

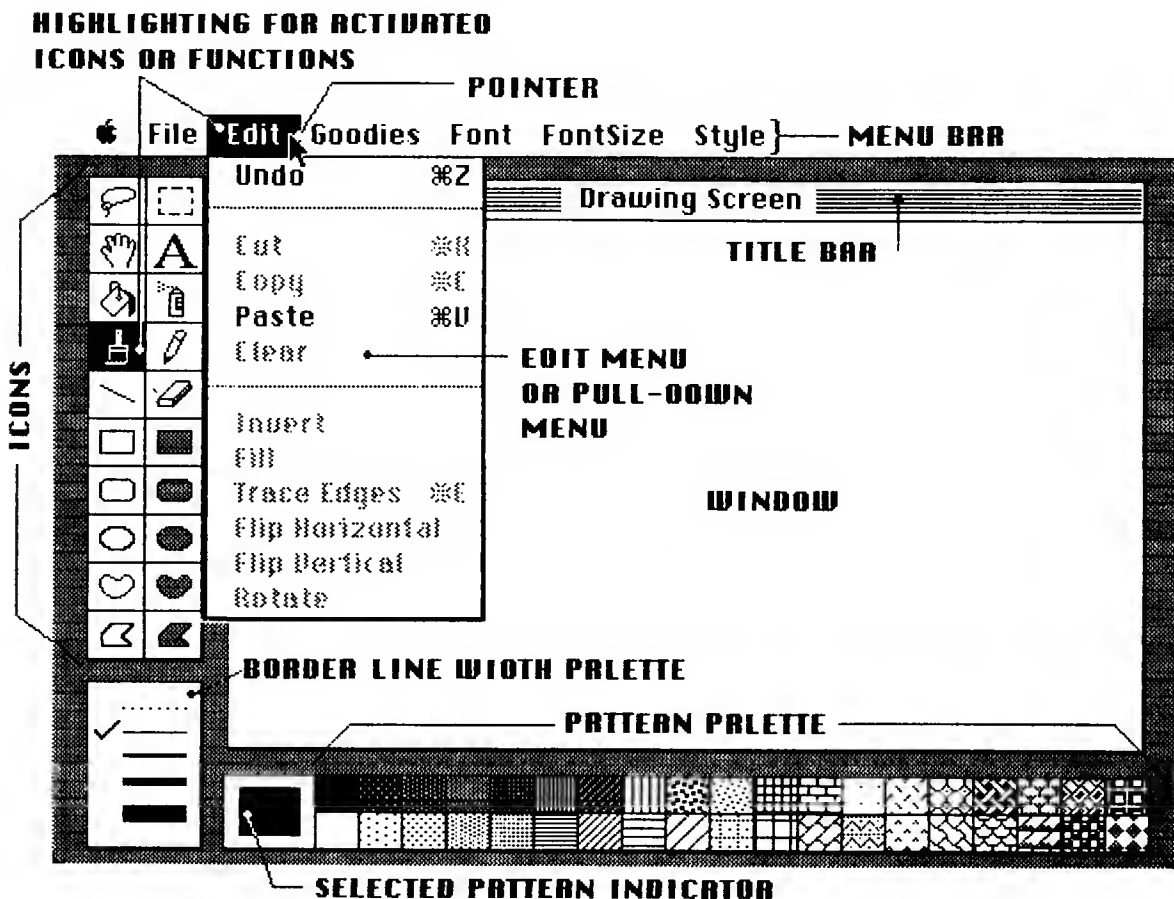


FIGURE 1.1. MacPaint Screen

## ***MacPaint's Drawing Screen***

Since information in this chapter will be presented on illustrated screens it is important that you understand the parts of the MacPaint screen. Figure 1.1 shows a labeled MacPaint screen.

### **Window**

The window is the visible drawing area on the screen that covers approximately one-third of an 8" x 10" page. The techniques for manipulating the window to access the remainder of the page are discussed later in this chapter (SCROLLING, pages 52-55) and again in Chapter 2 (Horizontal and Vertical Page Format, pages 88-91).

### **Document**

A document is all the drawing information you can place on one page. A page is equivalent to 8" x 9-15/16" or, for convenience of discussion, 8" x 10". You can create new documents, save documents, change documents, or throw documents away.





















### **Icons**

The icons, small pictures on the left and bottom margins of the screen, are the tools used to create your drawings. The icons are labeled in Figure 1.2. In this manual, when a specific icon is discussed, the icon is capitalized. Example: SPRAY PAINT or SPRAY PAINTING. Each icon is discussed later in this chapter.

### **Menu Bar and Pull-Down Menus**

Each item in the menu bar (the Apple, "File", "Edit", etc.) has its own pull-down menu which, after selecting a command, retracts like a window shade. The pull-down menu shown in Figure 1.1 is the EDIT menu. Commands presented on a menu in light gray cannot be selected until they are applicable to a particular situation and highlighted in black type. Black type indicates that a selection can be made. In Figure 1.1, PASTE can be selected and implemented but CUT, COPY, CLEAR, etc., cannot be selected until another set of conditions exists.

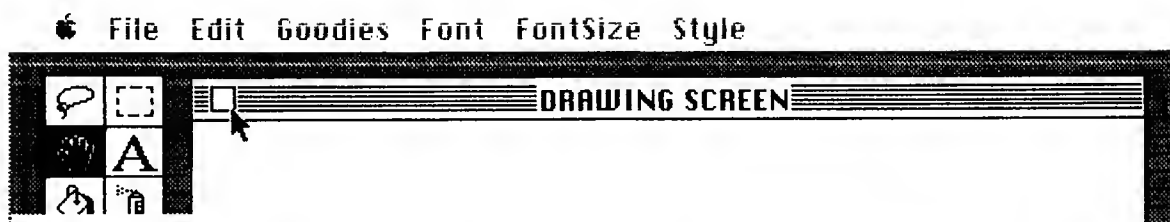
In some of the pull-down menus there are symbols and letters on the right hand side of the menu. These are combinations of keystrokes that can be used to select a command from the keyboard rather than from the menu.

|   |                                     |
|---|-------------------------------------|
|    | <b>LASSO</b>                        |
|    | <b>SCROLL</b>                       |
|    | <b>PAINT BUCKET</b>                 |
|    | <b>PAINTBRUSH</b>                   |
|    | <b>STRAIGHT EDGE</b>                |
|    | <b>MARQUEE</b>                      |
|    | <b>TEXT</b>                         |
|    | <b>SPRAY PAINT</b>                  |
|    | <b>PENCIL</b>                       |
|    | <b>ERASER</b>                       |
|  | <b>HOLLOW RECTANGLE</b>             |
|  | <b>HOLLOW ROUNDED<br/>RECTANGLE</b> |
|  | <b>HOLLOW OVAL</b>                  |
|  | <b>HOLLOW FREEFORM</b>              |
|  | <b>HOLLOW POLYGON</b>               |
|  | <b>FILLED RECTANGLE</b>             |
|  | <b>FILLED ROUNDED<br/>RECTANGLE</b> |
|  | <b>FILLED OVAL</b>                  |
|  | <b>FILLED FREEFORM</b>              |
|  | <b>FILLED POLYGON</b>               |

**FIGURE 1.2.** *Icon labels*



## CLOSE Box



*FIGURE 1.3. The arrow is pointing to the CLOSE box in the title bar.*

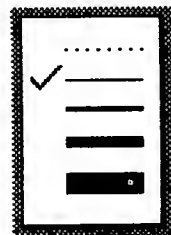
In the upper left corner of the window screen (behind the EDIT menu in Figure 1.1) is the CLOSE box (Figure 1.3). This is used to close a drawing document currently on the screen. Since you can only draw on one document at a time, each document must be closed before changing to another document. The CLOSE box is equivalent to CLOSE in the FILE menu.



*FIGURE 1.4. CLOSE in the FILE menu performs the same function as the CLOSE box in Figure 1.3.*

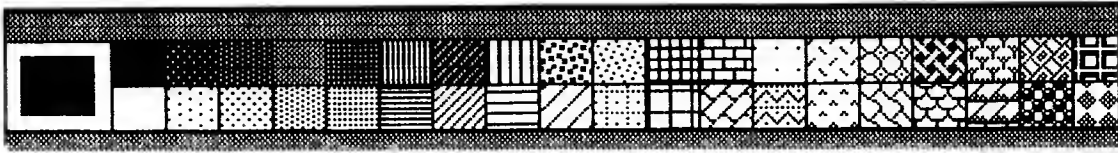
## BORDER LINE WIDTH PALETTE

When drawing RECTANGLES, OVALS, POLYGONS, FREEFORMS, or STRAIGHT EDGE lines, you have a choice of line width from the BORDER LINE WIDTH palette. The check mark indicates which border line has been selected. BORDER LINE WIDTHS can be solid black or PATTERNED. PENCIL and PAINTBRUSH icons are unaffected by the BORDER LINE WIDTH.



*FIGURE 1.5. The check mark indicates which line has been selected from the BORDER LINE WIDTH palette.*

## PATTERN Palette



*FIGURE 1.6. PATTERN palette has 38 patterns.*

There are 38 PATTERNS in the PATTERN palette. You can use these PATTERNS with FILLED SHAPES, PAINTBRUSH, and other icons which use BORDER LINE WIDTH. You can also create new PATTERNS which will be explained later in the chapter. The PATTERN indicator shows which PATTERN is currently selected.

## Title Bar

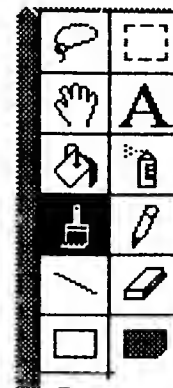
The title bar shows the name of the drawing on which you are currently working. The drawing document will be saved under the title shown in the title bar. Throughout Chapter 1, the title bar is used to describe the screen illustrations. Figure 1.3 shows a title bar for a document called "DRAWING SCREEN".

## Pointer

The pointer can be in the form of an arrow (as in Figure 1.1), a dot, or one of the icons. When the pointer appears as an arrow, selection from the menu bar, the PATTERN palette, or the icon palette can be made. Once the pointer is out on the drawing area it changes to either a dot, a cross, another arrow, or the form of a highlighted icon. If the Macintosh needs extra time to perform a task, the pointer changes to a wristwatch.

## Highlighting

Black highlighting appears on an icon or command from a menu when you have selected and are using a particular tool or function. In the screen illustrations used in this chapter, you will need to observe those icons and functions that are highlighted. The PATTERN indicator and check marks in the BORDER LINE WIDTH palette and highlighting in pull-down menus will all reveal information about how the graphics were created.



*FIGURE 1.7. Black highlighting of an icon.*

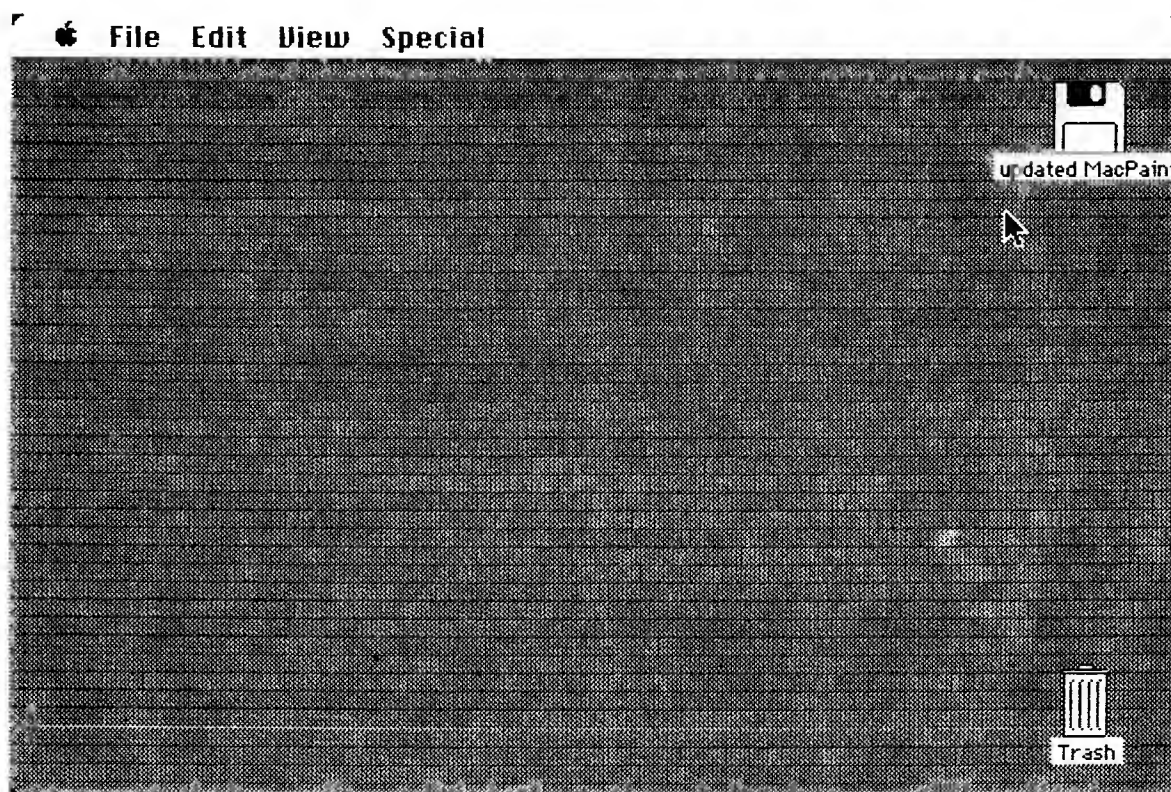
## Work Area

The work area or free drawing area is any place on the 8" x 10" document where a small drawing can be created or adjusted without interfering with the main drawing on the same document.

## *For Those without Guided Tours or Macintosh Manuals*

This portion of Chapter 1 is not a substitute for Macintosh manuals, or demonstration diskettes and audio cassettes (“**A Guided Tour of Macintosh**” and “**MacPaint-Macwrite, a Guided Tour**”). If you do not have access to these learning tools, this section will guide you through Macintosh’s entrance into MacPaint and basic mouse movements.

The Macintosh power switch is in the back of the machine, halfway up on the left side. The power can be either on or off before putting in a diskette. The diskettes are popped into the slot, the internal disk drive, on the front of the Macintosh. Place your MacPaint diskette, metal end first and label side up, into the slot on the Macintosh. After considerable whirring, humming, and a smiling Mac looking at you, Macintosh will be waiting for its next instructions from you and the mouse. Your screen may look like Figure 1.8:

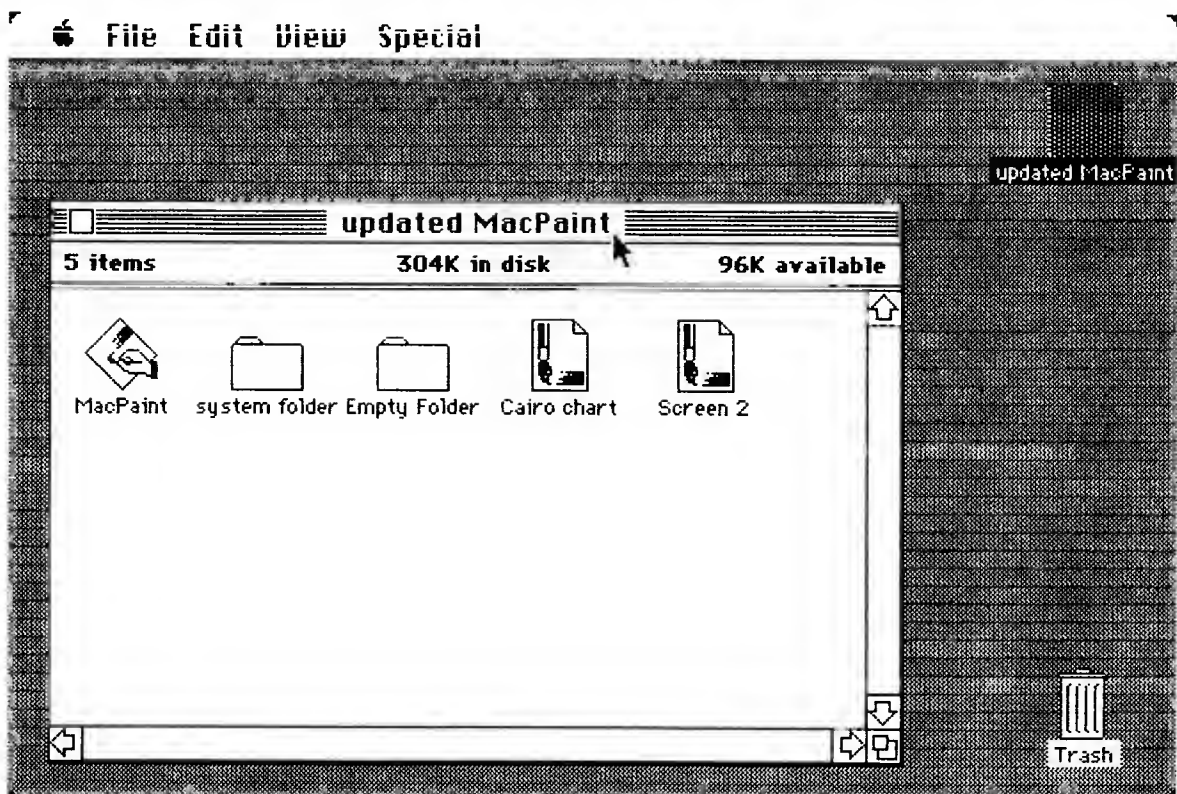


**FIGURE 1.8.** *This should be the first screen to appear after putting MacPaint into the disk drive.*

This is the Macintosh desktop. The icons on the upper right side of the screen represent the diskette you just inserted into the disk drive. The “Trash” icon in the lower part of the screen is where you toss out documents no longer needed. If your screen did not look like Figure 1.8, someone else has probably rearranged the desk top or not put their work away when the diskette was last used. To get your screen to look like Figure 1.8 just move the pointer into the close

box and press the mouse button. Continue this procedure until your screen appears like Figure 1.8.

Your Macintosh documents, tools, and functions are selected and activated by the Macintosh **mouse**. As you slide the mouse on a smooth, clean table, a pointer will move correspondingly on the screen window. For selecting documents, menus, commands, and using the MacPaint icons, you will be performing two types of mouse movements; **clicking** or **dragging**. Try moving the mouse about on the table. Notice how the arrow on the screen follows the mouse movements. If your mouse bumps into the computer or runs off the table, just pick the mouse up and place it back where you have more room. **Now move the arrow over the highlighted icon and press the mouse button twice in rapid succession, called "double clicking" the mouse.** This movement has opened a window for you.



**FIGURE 1.9.** The Macintosh desktop viewed through a window shows the contents of "updated MacPaint".

Inside the window are documents that you can move around the desk top. You can move a document into the trash can, onto another diskette, or you can open a document and look inside. Move the arrow over one of the documents on the screen and press the mouse button one time. **Pressing the mouse button one time is called "clicking" the mouse.** Notice that the document becomes highlighted and activated when clicking over it. Now press the mouse button while moving the mouse. **Pressing the mouse button while moving the mouse is called "dragging".** A dotted outline of the document should follow the arrow. After releasing the mouse button the highlighted document should fill its out-

lined form. Dragging is used throughout Macintosh applications to move words, icons, documents, or portions of drawings around the screen.

There are different types of documents on the screen. System Folder is what makes Macintosh work. You can use Empty Folders to store documents in a manner most convenient to you. Now, double click a document with a paintbrush in hand, entitled MacPaint. This takes you to a clean drawing screen with the word UNTITLED in the title bar. If you don't have an UNTITLED document, move the pointer to the FILE menu, press the mouse, and drag the pointer through the menu until NEW is highlighted. Then release the mouse button.

MacPaint disks can be set up so that when you place the diskette into the drive, the program will go directly to an UNTITLED drawing screen rather than letting you view the Macintosh desktop. To get to the desktop from a MacPaint document or when you have finished with MacPaint, click the close box in the title bar. This will clear MacPaint from the screen. Selecting FILE from the menu bar and dragging down through the menu until QUIT is highlighted will return you to the Macintosh desktop.

Let's try some easy exercises to acquaint you with some of MacPaint's invaluable features. If you are not currently in a MacPaint document, double click the MacPaint document from the Macintosh desktop.

When you first enter a MacPaint document, the selected tool waiting for your use will be the PAINTBRUSH. The pointer represented is a black dot. Move the pointer over to the PENCIL icon. Notice how the black dot changed to an arrow. Click the PENCIL icon and note how the icon changed from a white background to black with a white pencil. The highlighted icon is always the tool that is presently active. Now move the arrow back out to the drawing screen without pressing the mouse button. As you enter the drawing area the arrow changes to a pencil. The pointer will change to an arrow each time it leaves the drawing area. With the PENCIL on the drawing screen, press the mouse and drag it across the table to create a pencil line on the screen. If you didn't like the looks of your pencil line, move PENCIL up to the menu bar and click EDIT. Drag the arrow to UNDO and release the mouse button. Did you notice how the last line you drew vanished? UNDO lets you undo the very last thing added to your drawing. It will be one of your most powerful MacPaint tools.

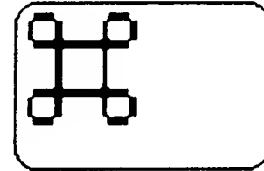
Repeat the UNDO procedure again. Your line just reappeared. You can UNDO several times. This allows you to try all sorts of things without risk of spoiling your drawing. However, UNDO can only undo the very last thing you did. When in doubt, don't click the mouse button until you try UNDO. If you were right the first time, another UNDO will reinstate your original drawing change.

Now, move the pointer to the ERASER icon located under the PENCIL. With pencil lines on the screen, double click the ERASER. The entire screen cleared.

This may happen to you unintentionally. Don't panic. Select UNDO and your drawing will reappear. Knowing how to use the mouse, enter MacPaint documents, and correct simple mistakes prepares you to continue on with other MacPaint lessons.

## **Keyboard Keys**

In addition to the mouse, there are keys on the keyboard that can be used with the mouse to take short cuts in your work or activate other features. Keys most frequently used are the OPTION key, the SHIFT key, the BACKSPACE key, and the COMMAND key, which has a clover-like symbol (Figure 1.10).



**FIGURE 1.10.** Keyboard's **COMMAND** key.

Whenever you use keyboard keys in conjunction with the mouse, always press the keyboard keys slightly ahead of the mouse button. Signals from the mouse override signals from the keyboard unless the keys are pressed first. Once the mouse button is pressed, you can release the keyboard key. There will be no change of action until the mouse button is released.

The following illustrations show you how to use each MacPaint tool. The illustrated screen shows a numbered drawing. Numbered text in **bold** type details the steps involved in creating the graphics on the illustrated screens. In plain type, text provides additional information, such as the effects of double clicking and the use of the SHIFT, OPTION, or COMMAND keys. Whenever possible, graphics created with MacPaint accompany the notes for clarification and easy reference.

The format followed in this chapter is to first present those icons that perform as design elements: line, shape, pattern, and texture. Next are icons that perform screen functions, such as ERASING or TEXT writing. Presented last in this chapter are functions from the menu bar. Since many of the features are used throughout Macintosh software, only those components from the menu bar that are specific to MacPaint are discussed.

So pay attention to highlighting, check marks, and the PATTERN indicator on the following screen illustrations and let's begin learning more about MacPaint....



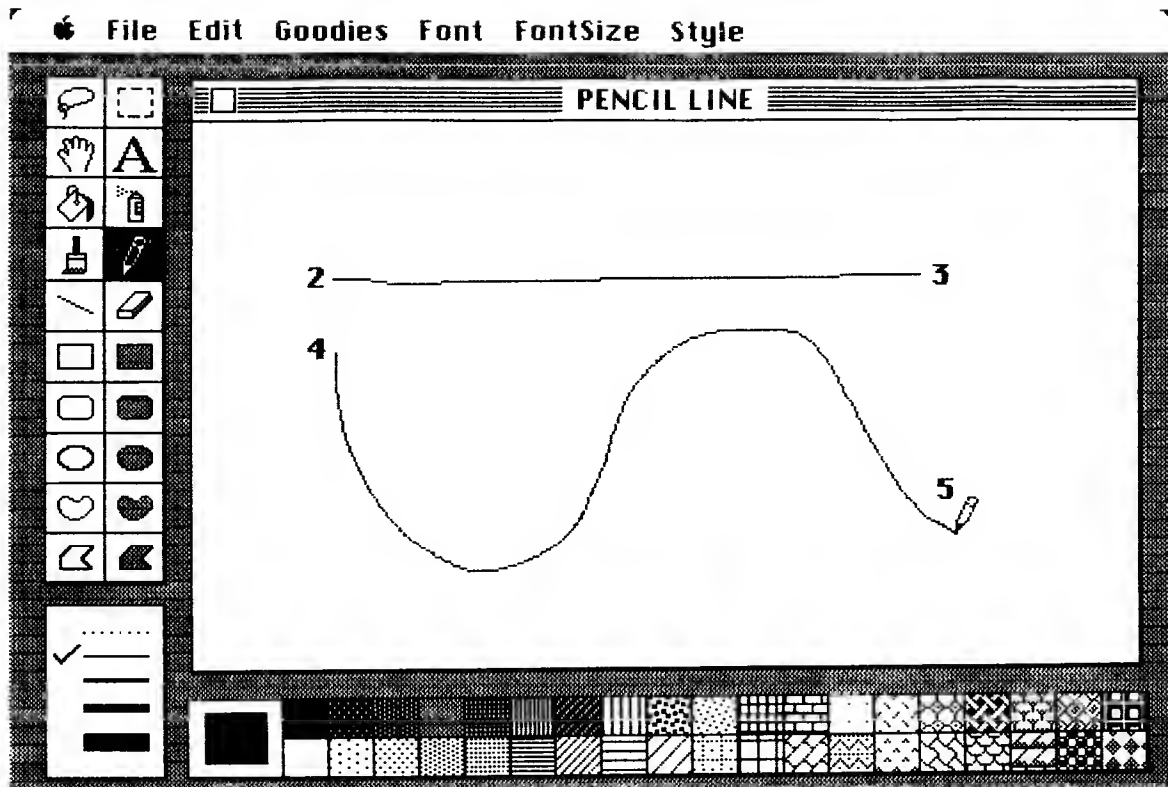
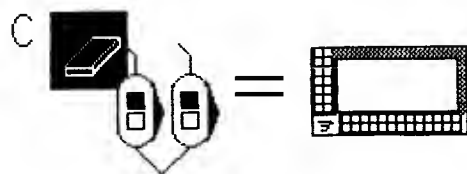
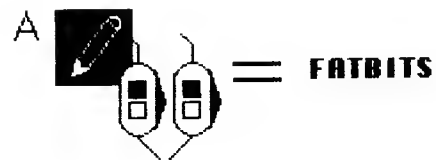
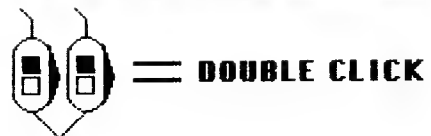


FIGURE 1.11.



## Lines

With the PENCIL you can draw lines in any direction.

1. Select PENCIL by clicking over the PENCIL icon.
- 2-5. Draw lines by dragging PENCIL.

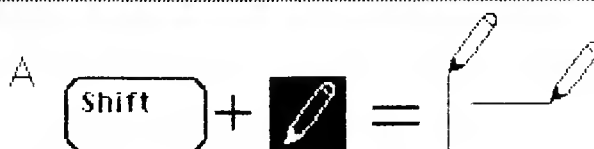
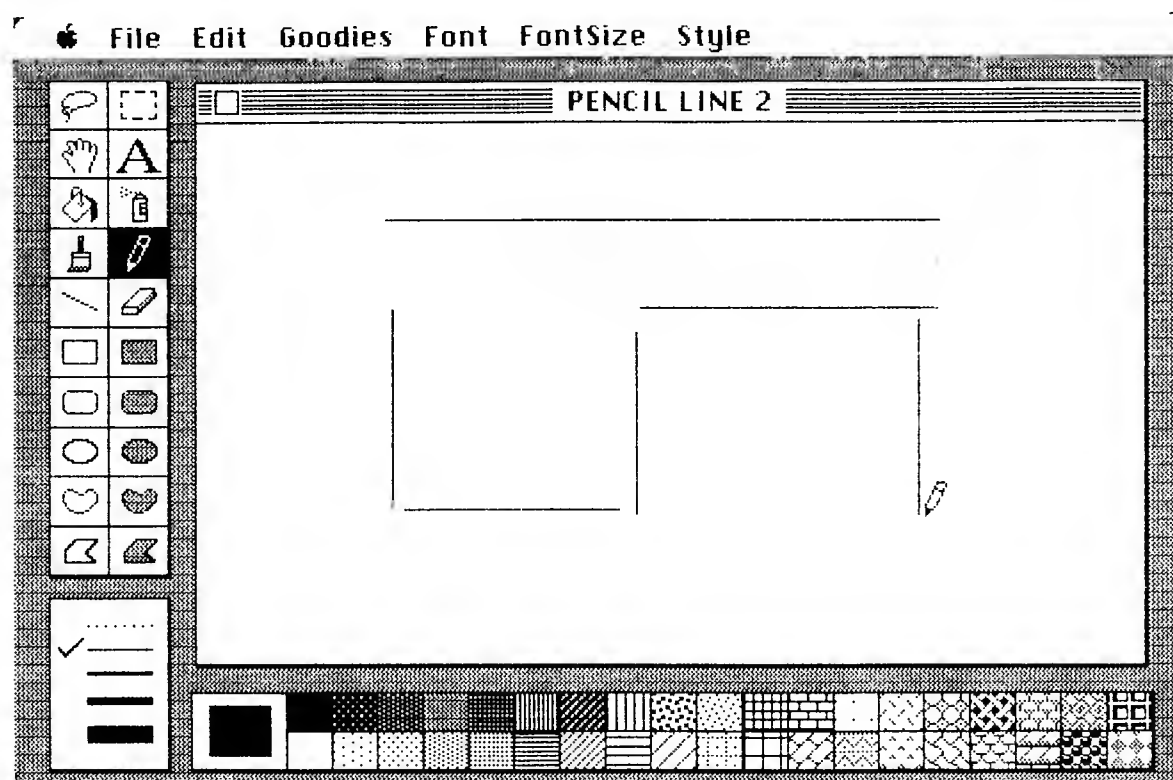
PENCIL line width is one dot wide and does not vary in its width. Free-hand PENCIL lines have a jagged quality as opposed to the smoother appearance of other wider lines.

Double clicking the PENCIL takes you into FATBITS (A). FATBITS is an opportunity to clean up rough lines dot by dot (discussed in GOODIES, page 58). Clicking the PENCIL while it is on the drawing screen with the COMMAND key pressed also allows you to enter and exit FATBITS (B).

---

 Double clicking the ERASER icon clears your screen for the next screen illustration (C).

---



**FIGURE 1.12.**

To draw smooth, straight lines, select PENCIL then press the SHIFT key before pressing the mouse button to begin drawing (A). You can release the SHIFT key while the PENCIL continues to draw in a straight, vertical, or horizontal direction until the mouse is released.

Click the PENCIL directly on your pencil line. Dragging the PENCIL, retrace the line. The line should disappear. Anytime the mouse is clicked when

PENCIL is sitting on a black line or background, the lead will be white as you draw away from that point. When the PENCIL appears not to be working, you may have begun dragging the PENCIL on top of another line. Just click the mouse without sliding it to restart the PENCIL in its appropriate lead color.

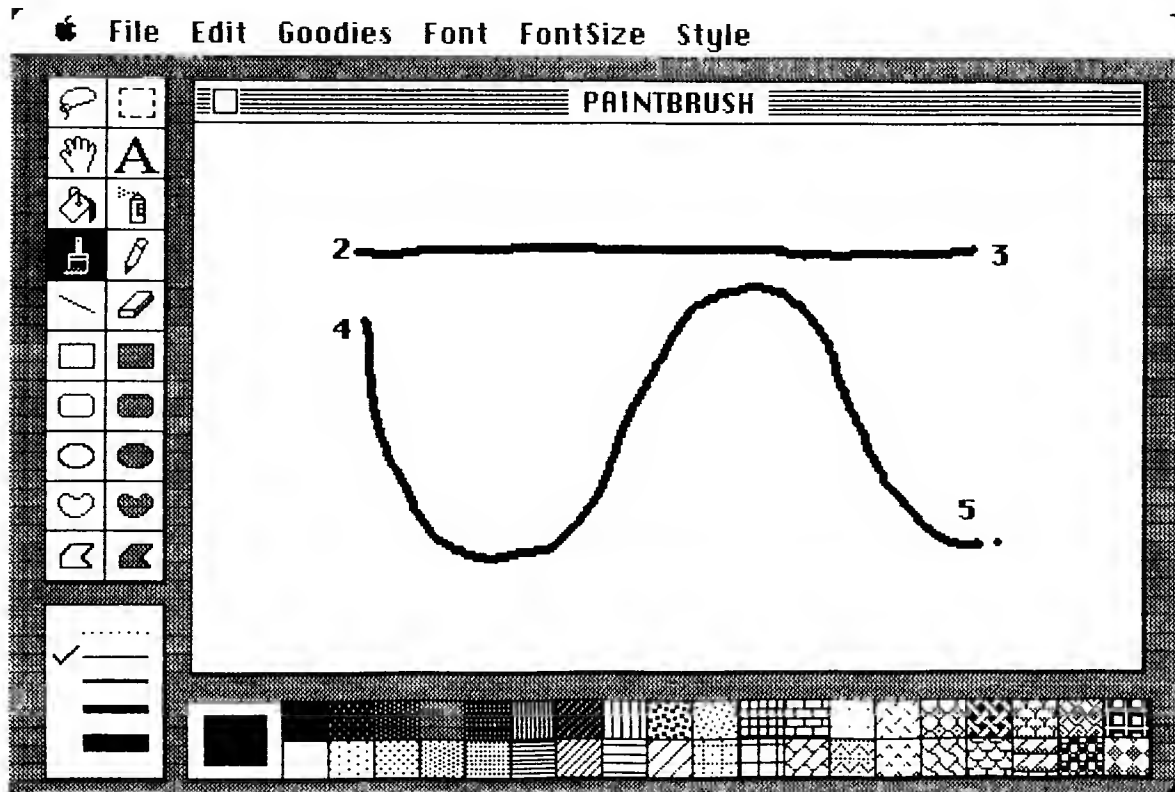


FIGURE 1.13.

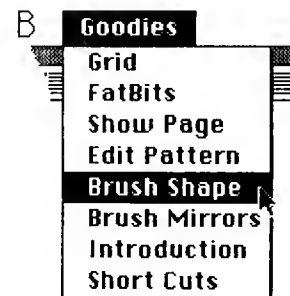
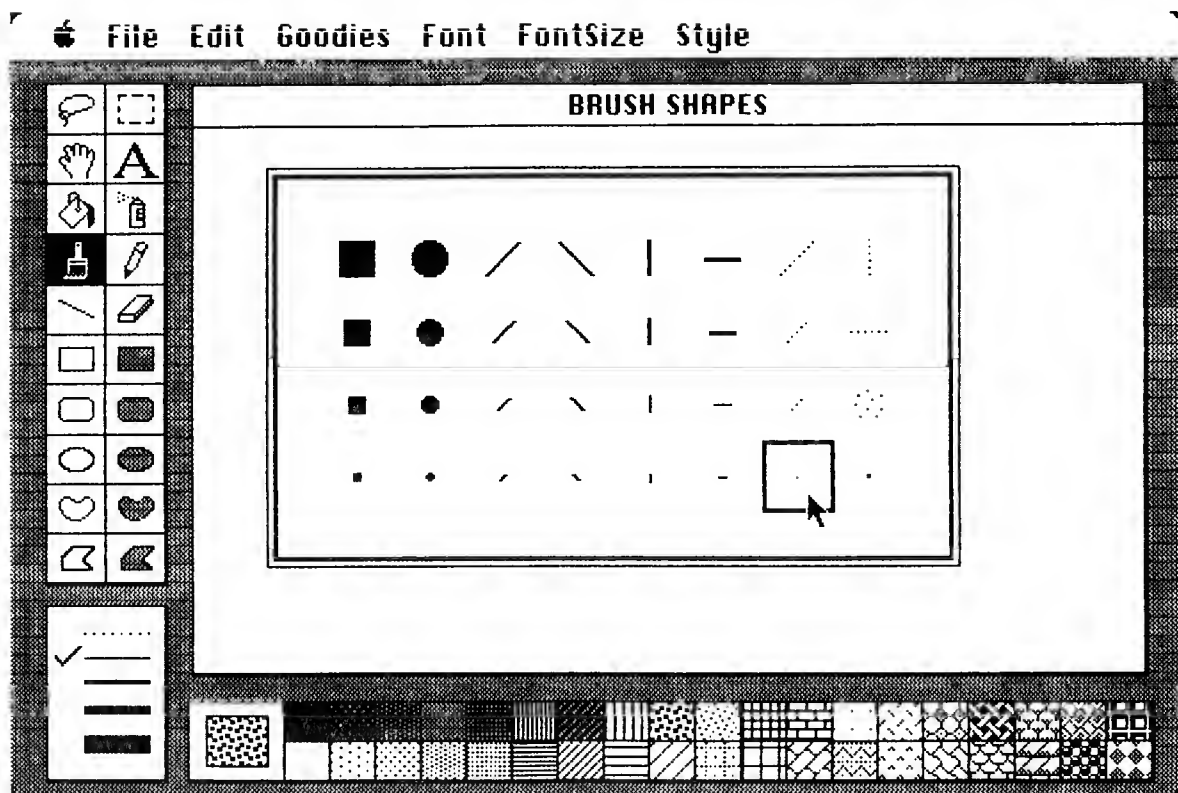
With the PAINTBRUSH icon you can paint lines in any direction varying PATTERN and BRUSH SHAPE.

**1. Select PAINTBRUSH.**

**2-5. Paint lines by dragging PAINTBRUSH.**

The PAINTBRUSH paints the PATTERN selected from the PATTERN menu. In Figure 1.13, the PATTERN is solid black. To change the PATTERN, move the pointer over a new PATTERN in the PATTERN palette. The PATTERN indicator indicates the currently active PATTERN (see Figure 1.17). The PAINTBRUSH also paints with solid white PATTERN, which is one way to erase lines (see Figure 1.42).

The PAINTBRUSH pointer appears as a brush shape. In Figure 1.13, the dot at the end of the line (5) is the BRUSH SHAPE. Figure 1.14 shows the various brush shapes and sizes. To select different BRUSH SHAPES, double click the PAINTBRUSH (A) or drag through the GOODIES menu (B).



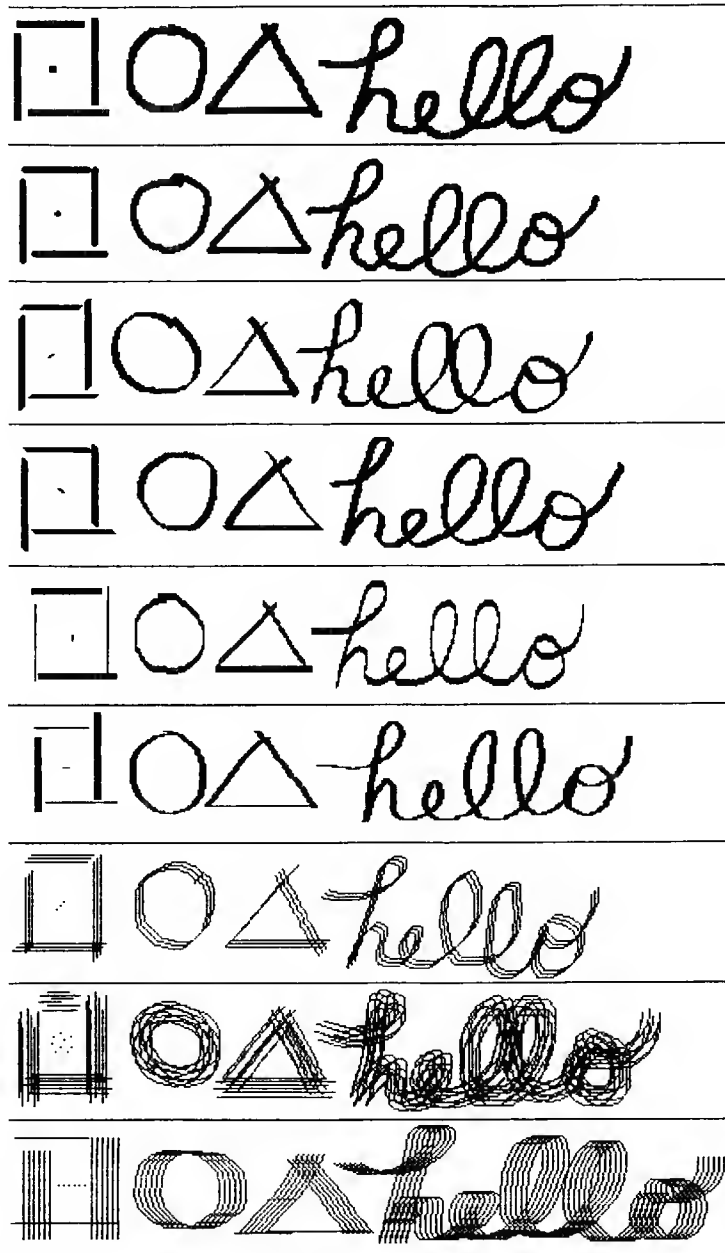
**FIGURE 1.14.**

Double clicking over the PAINTBRUSH or selecting BRUSH SHAPES from the GOODIES menu allows you to change brush shape and width. Although there are 32 brush shapes, a box surrounds the brush shape in current use.

1. Double click over PAINTBRUSH icon or drag pointer through GOODIES menu and release mouse when BRUSH SHAPES is highlighted.
2. Click desired BRUSH SHAPE. You will be immediately returned to the drawing screen.

The smallest BRUSH SHAPE produces results identical to the PENCIL. This one-dot wide PAINTBRUSH has an advantage over the PENCIL as long as the PATTERN indicator is solid black. The PAINTBRUSH line will always be black no matter where you start dragging it as opposed to the PENCIL which frequently produces white lead.

Variation in line weight is one aspect that frequently makes hand drawings more interesting than computer drawings. Becoming familiar with PAINTBRUSH SHAPES is one way to create drawings with greater interest and less of the stiffness sometimes associated with computer graphics.



**FIGURE 1.15.** *Effects of BRUSH SHAPES. Each brush shape is shown in the center of the square figure.*

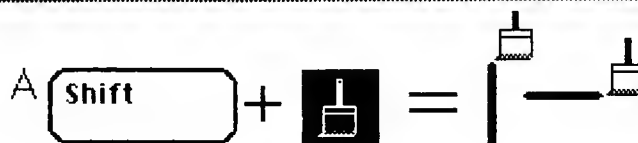
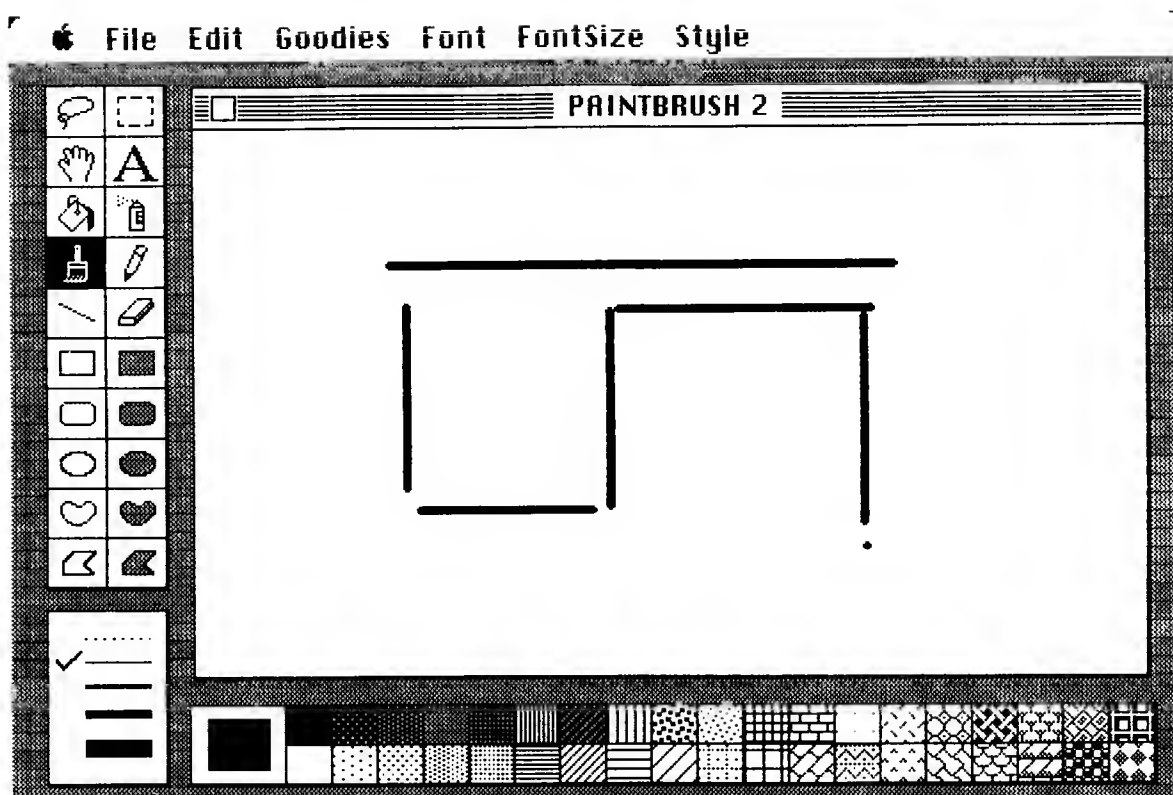
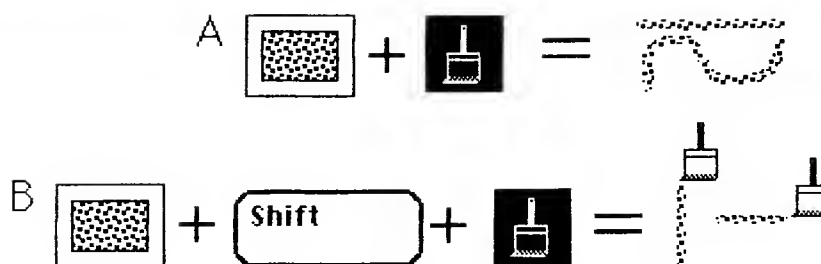
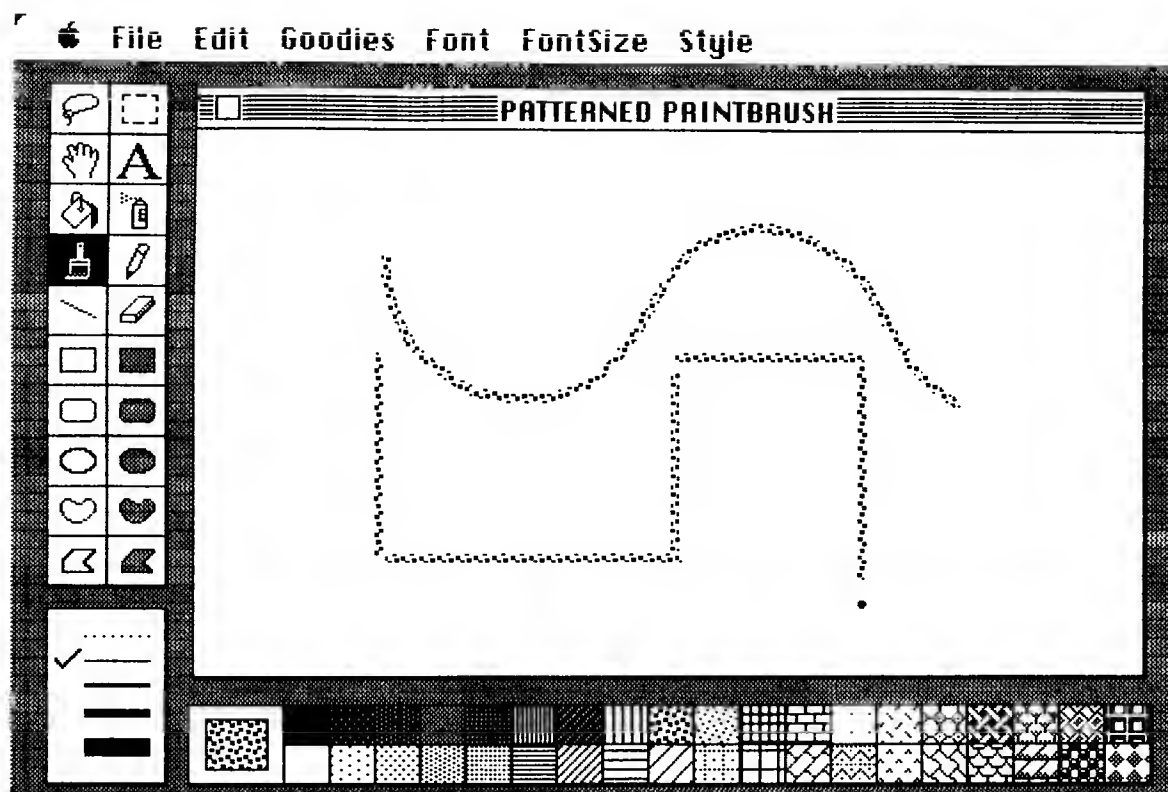


FIGURE 1.16.

The SHIFT key and PAINTBRUSH together produce straight horizontal and vertical lines.

When using the keyboard with the mouse, always press the keyboard keys before pressing the mouse button. Once the PAINTBRUSH has begun painting, the SHIFT key can be released and lines will continue in one straight direction. If this does not occur, you are probably pressing the mouse button slightly ahead of the keyboard.






**FIGURE 1.17.**

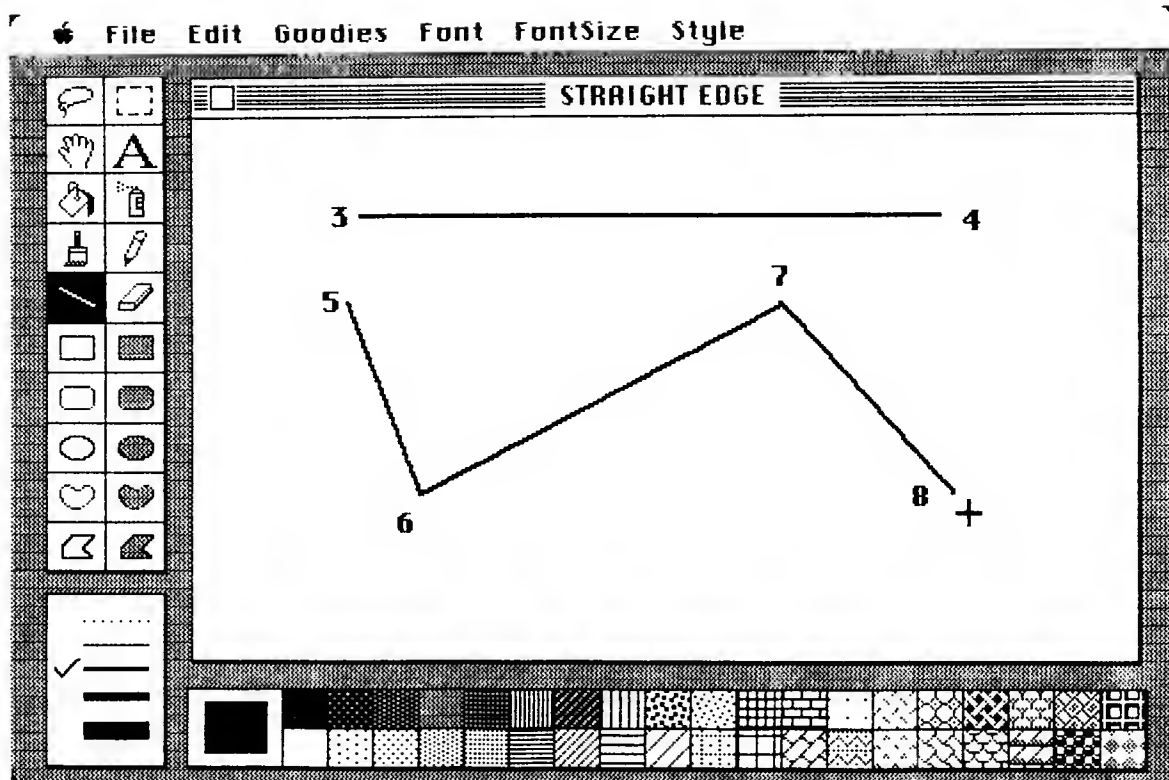
Figure 1.17 shows the results of the PATTERNED PAINTBRUSH. A new PATTERN was selected by clicking the pointer over the desired PATTERN in the PATTERN palette.

---

 If nothing happens when you begin painting with the PAINTBRUSH, check the PATTERN indicator. It may be holding white paint, which is convenient only if you want to erase parts of a drawing.

---

One way to create a dotted line is to use the smallest PAINTBRUSH, a dotted PATTERN from the PATTERN menu, and the SHIFT key. If you don't see any results, start again by repositioning your PAINTBRUSH. For different dotted line types—dashes and dots—edit one of the dotted PATTERNS by double clicking over the PATTERN most closely resembling your desired PATTERN. See page 31 for PATTERN EDIT.



**FIGURE 1.18.**

The **STRAIGHT EDGE** icon is used to draw straight lines of varying widths, directions, and **PATTERNS**.

1. Select **STRAIGHT EDGE**.
2. Select line width from **BORDER LINE WIDTH** palette.
- 3-8. Draw lines by dragging **STRAIGHT EDGE**.

A cross represents the **STRAIGHT EDGE** pointer on the drawing screen. The **STRAIGHT EDGE** takes advantage of both the **SHIFT** and **OPTION** keys as shown in the following figures.

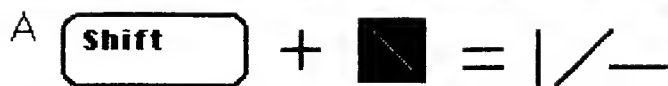
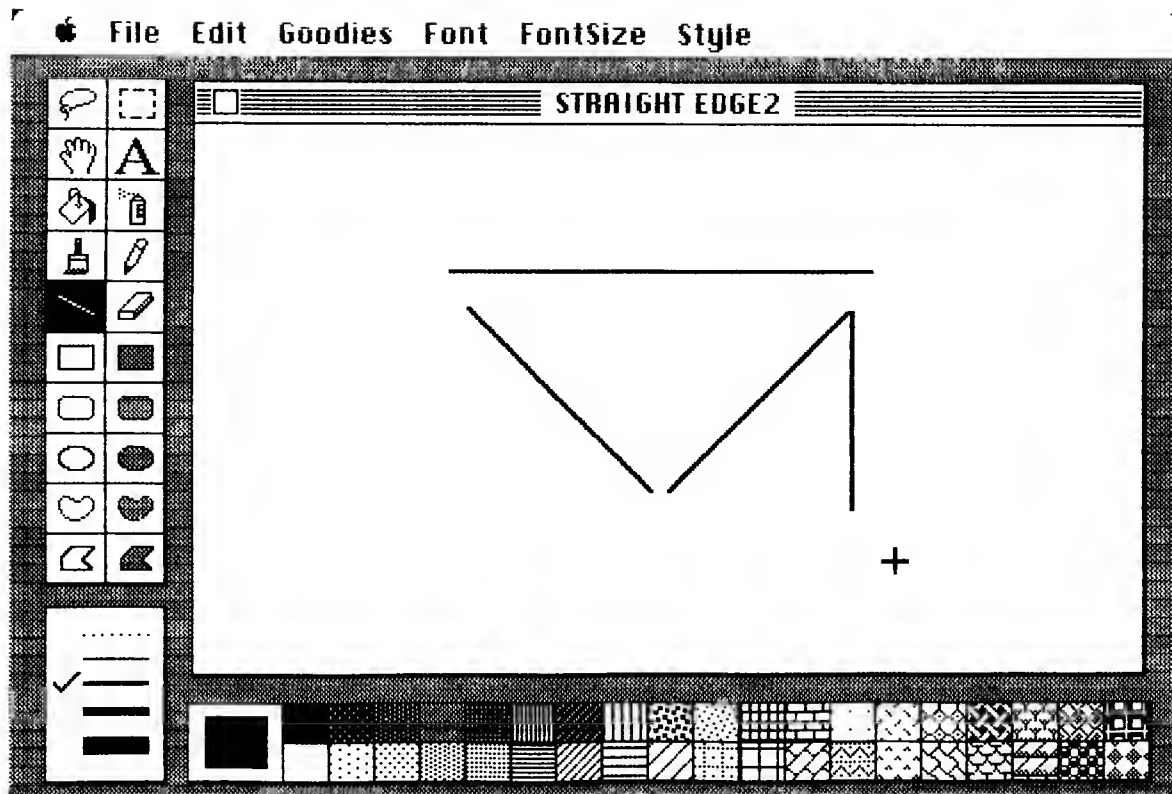
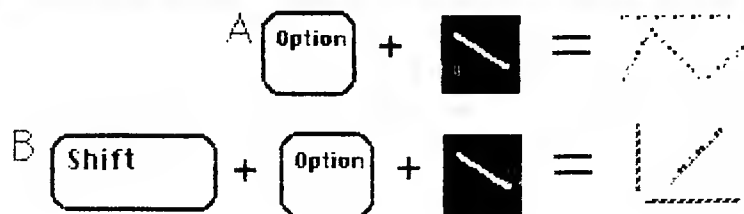
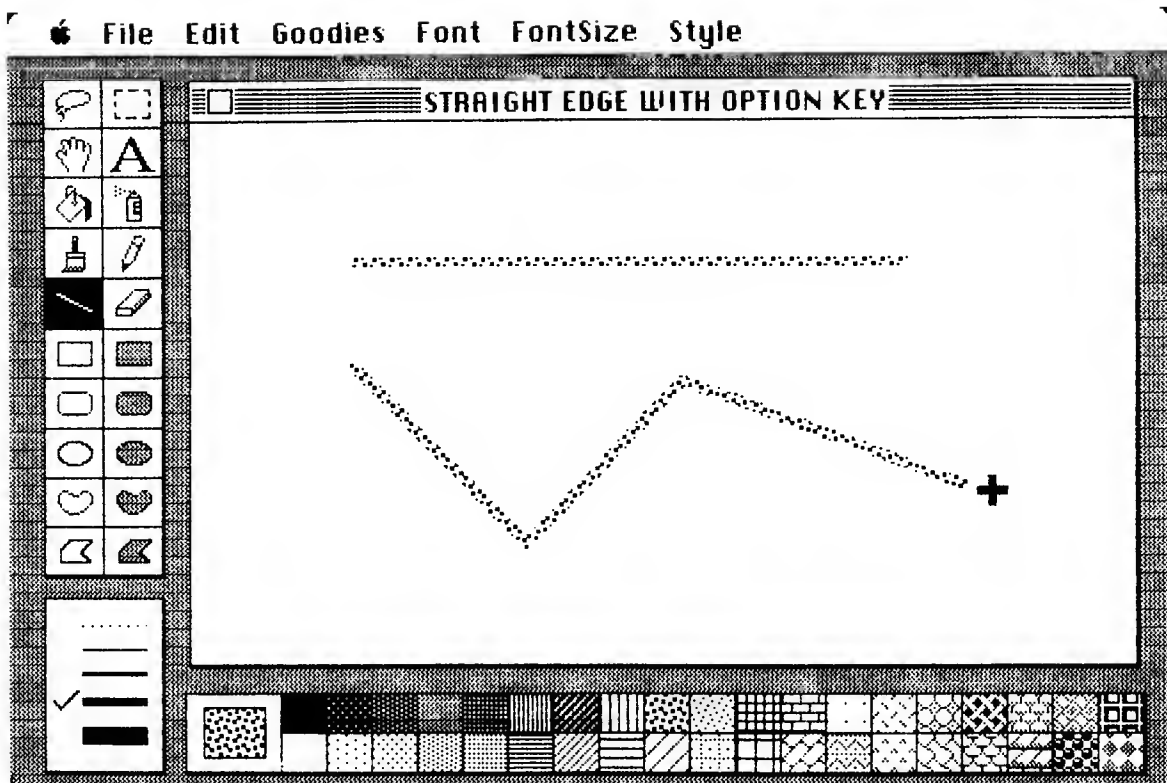


FIGURE 1.19.

As with PENCIL and PAINTBRUSH, using the SHIFT key with the STRAIGHT EDGE (A), restricts lines to vertical, horizontal, or 45° angles.

Line widths in the BORDER LINE WIDTH palette can be measured in dots. The two thinnest lines are one dot wide. Line widths increase to two-dot, four-dot and eight-dot line widths. The first line, which appears as a dotted line in the palette, is used with FILLED SHAPES (see page 26, FILLED RECTANGLE). It does not appear as a dotted line when used with the STRAIGHT EDGE, but rather a solid, one-dot line.



**FIGURE 1.20.**

When a **PATTERN** other than solid black is in the **PATTERN** indicator, you can use the **OPTION** key with **STRAIGHT EDGE** to produce patterned lines (A). This can be another good way to create dotted lines.

Use the **SHIFT** and **OPTION** keys to produce patterned lines at vertical, horizontal, or 45° angles (B).

This concludes our discussion of those icons whose main purpose is line drawing. Shapes follow.....

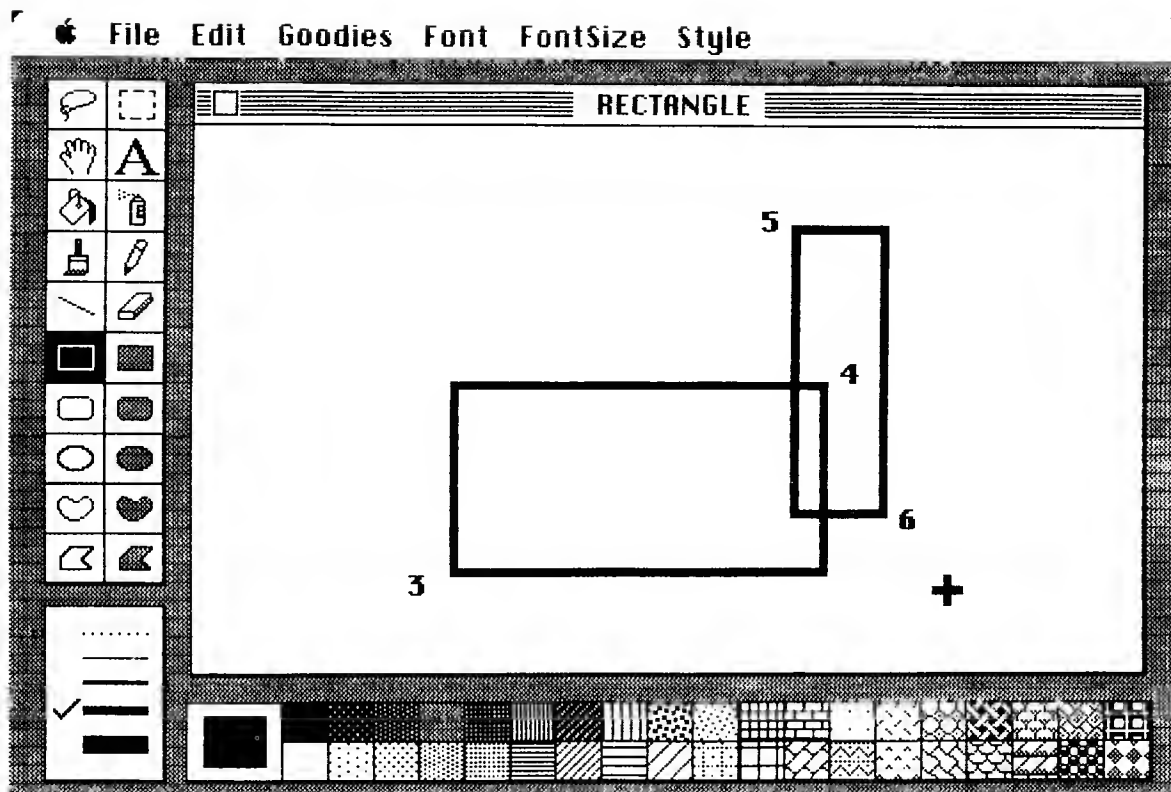
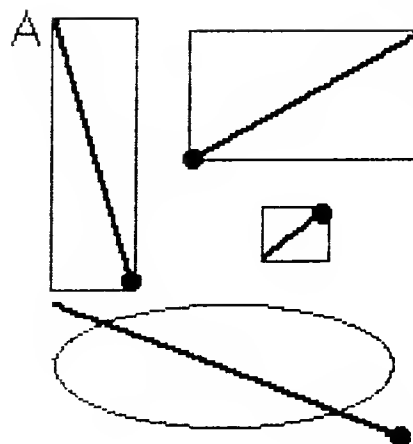



FIGURE 1.21.

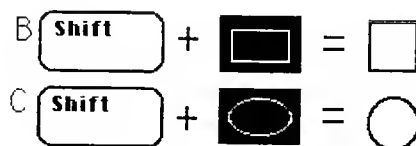
## Shapes

HOLLOW RECTANGULAR and OVAL shaped icons are used to create smooth, symmetrical shapes with a single, diagonal stroke of the mouse. These shapes change proportions depending upon the distance and the diagonal direction in which the mouse is moved (A).

1. Select **HOLLOW RECTANGLE** icon.
2. Select **BORDER LINE WIDTH**.
- 3-6. Draw **RECTANGLE** by dragging cross-shaped pointer diagonally. Release mouse when you have the desired shape and size.



 To draw round circles and square squares, press the keyboard's **SHIFT** key when you drag ovals and rectangles (B&C).



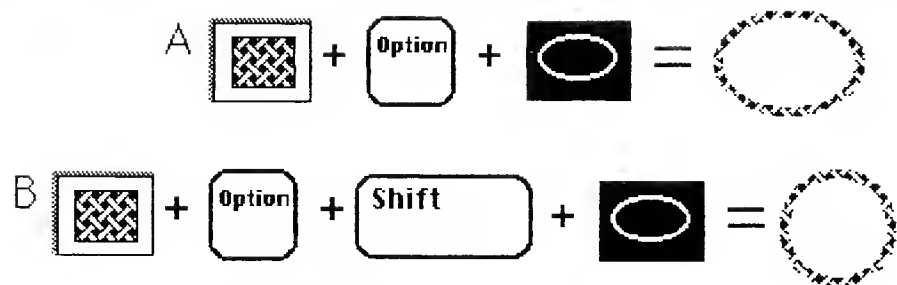
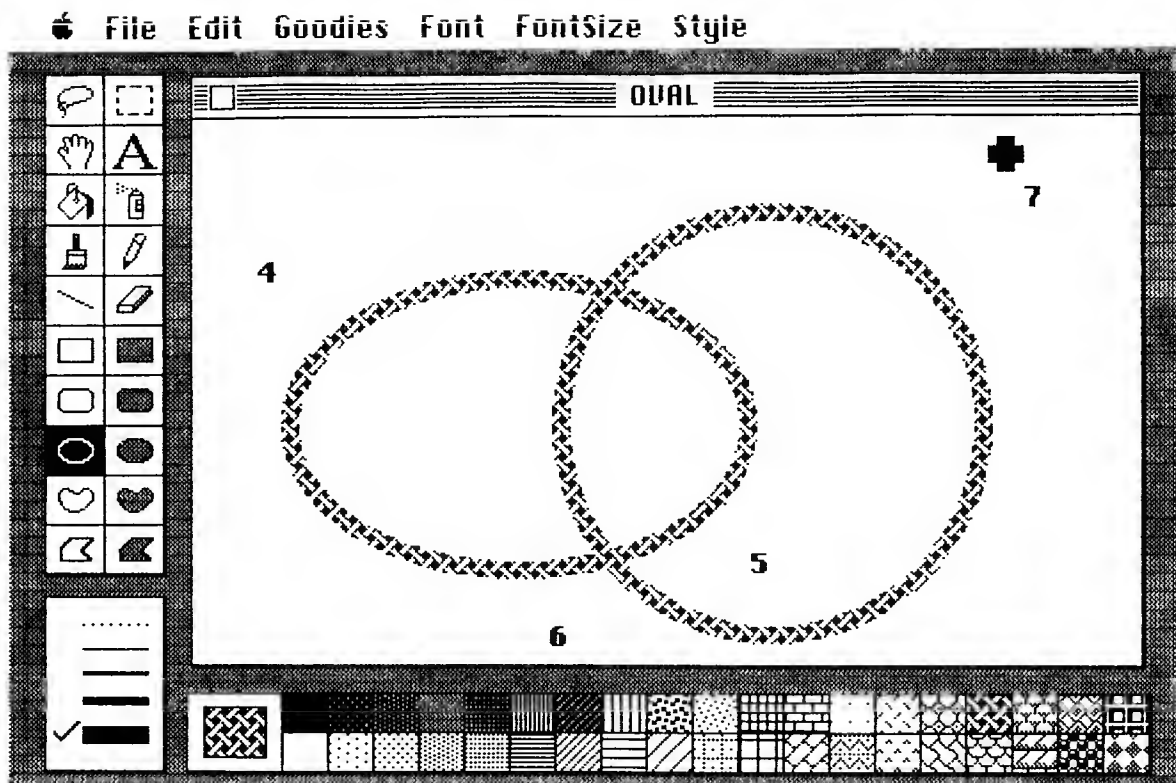


FIGURE 1.22.

Like HOLLOW RECTANGLES, HOLLOW OVALS are drawn on a diagonal. Like all HOLLOW SHAPE icons, HOLLOW OVALS are transparent as you draw them overlapping other images. When the OPTION key is used with any HOLLOW SHAPE, the border becomes the selected PATTERN in the PATTERN indicator rather than black (A).

1. Select HOLLOW OVAL.
2. Select PATTERN.
3. Select BORDER LINE WIDTH.
- 4-5. Draw OVAL with PATTERNED border by pressing the OPTION key and dragging the pointer diagonally.
- 6-7. Draw a circle using the SHIFT and OPTION keys for PATTERNED border.



Try the SHIFT and OPTION keys together to create circles with PATTERNED borders (B).

Remember, keyboard keys used with mouse control must be pressed just before the mouse button is pressed. Once the mouse button is pressed, the keyboard keys can be released.

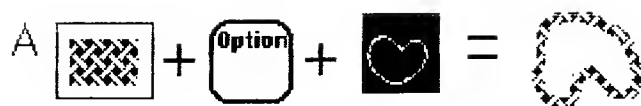
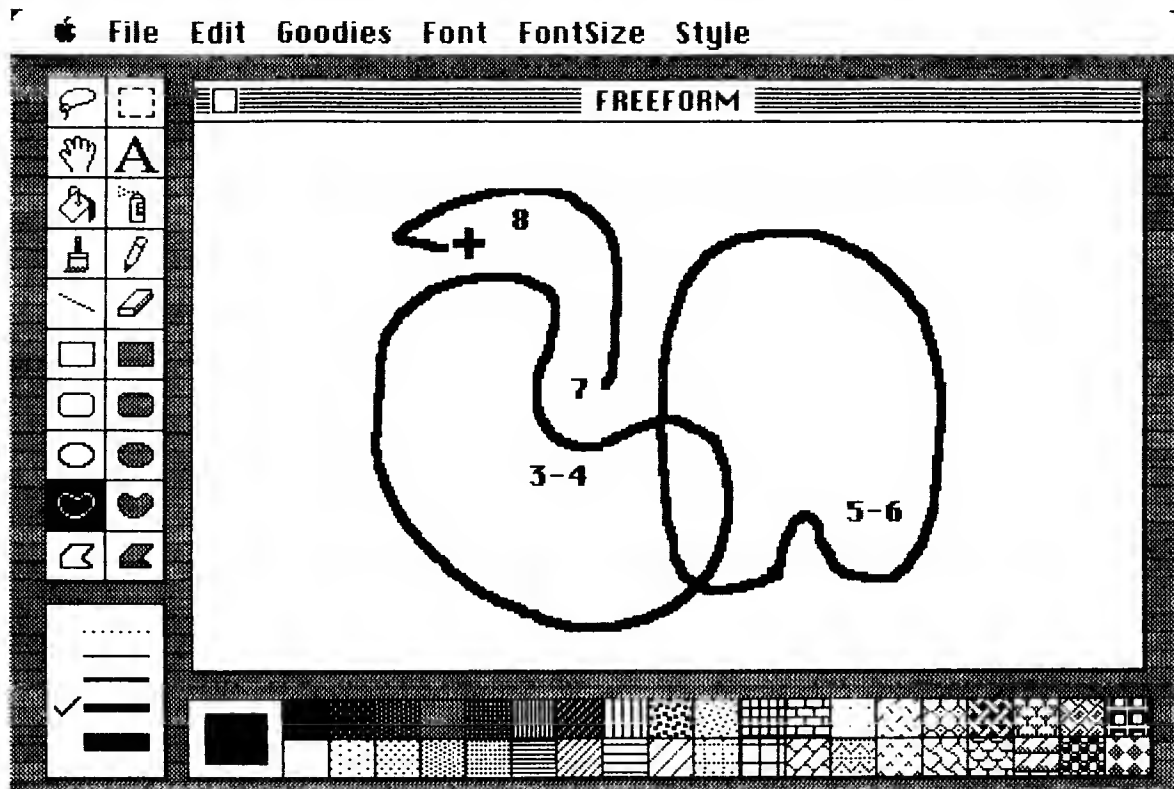


FIGURE 1.23.

FREEFORM icon and POLYGON icon are used to create assymetrical shapes of your choice. These shapes must be drawn out as you want them with a beginning point and an end, unlike the symmetrical RECTANGLE and OVAL shapes. The HOLLOW FREEFORM shape can also be used to draw lines.

1. Select **FREEFORM** shape.
2. Select **BORDER LINE WIDTH**.
- 3-6. Draw shapes by dragging the pointer.
- 7-8. Draw a line.

The **OPTION** key will provide **FREEFORM** shapes with **PATTERNED** borders (A).

Line quality in **FREEFORM** shape is similar to free flowing lines of **PENCIL** and **PAINTBRUSH**. One difference between the three icons is that **PENCIL** and **PAINTBRUSH** do not use the **BORDER LINE WIDTH** palette.

The **SHIFT** key has no effect on **FREEFORM** Shape.

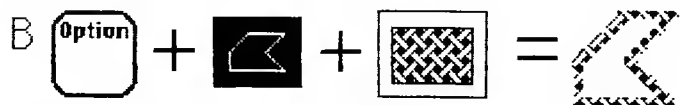
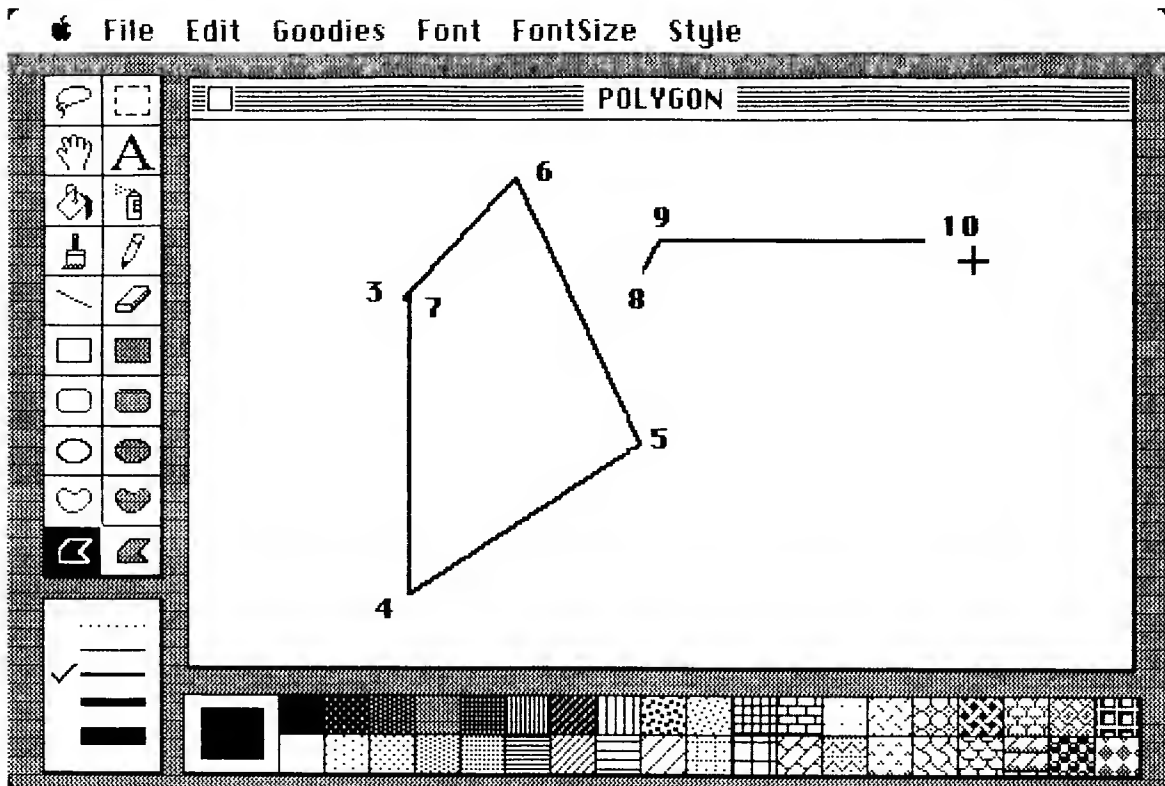


FIGURE 1.24.

You can use a **HOLLOW POLYGON** icon to draw either lines or shapes.

1. Select **HOLLOW POLYGON**.
2. Select **BORDER WIDTH**.
- 3-7. Draw **POLYGON** by dragging pointer and clicking at each bend.
- 8-10. Draw a line with **POLYGON**, double click mouse to end the line.

 The borders of a POLYGON follow the pointer anywhere until it ends at the point it began! Double click to drop the line when it appears to be glued to the pointer.

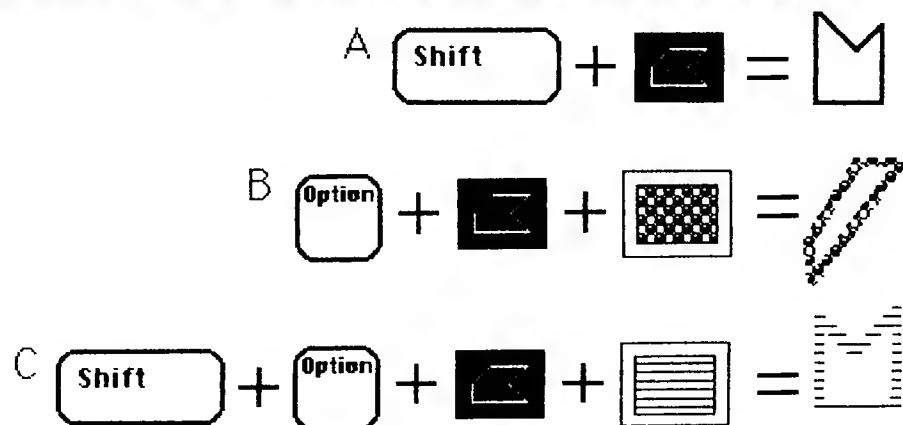
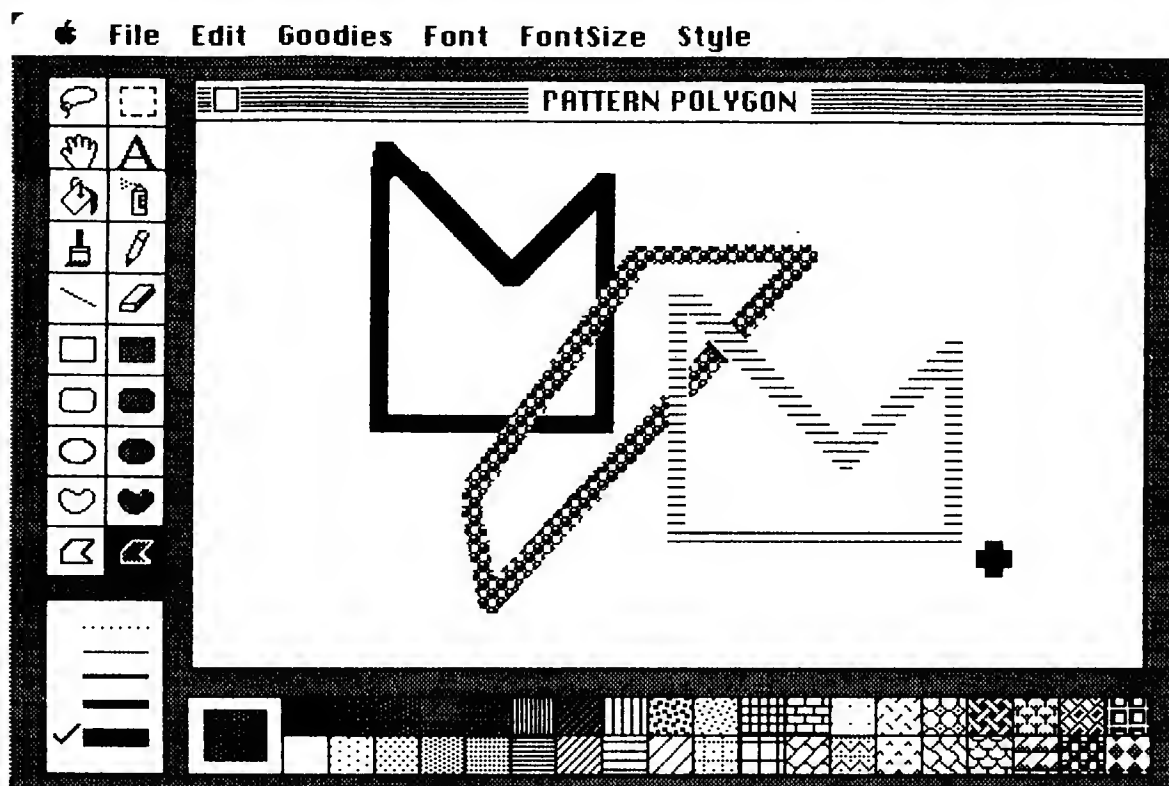
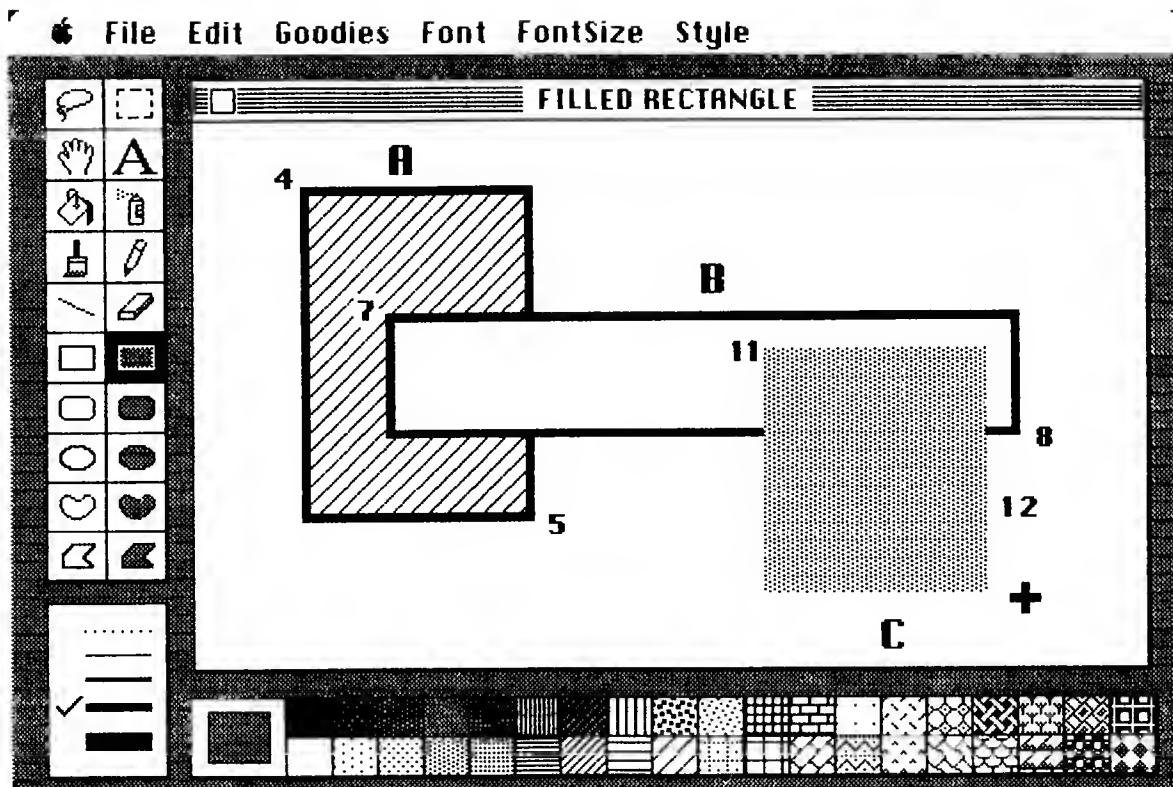


FIGURE 1.25.

The SHIFT key will keep the sides of POLYGON horizontal, vertical, or at a 45° angle (A).

The OPTION key will give POLYGONS patterned borders (B).

Notice that borders of HOLLOW shapes are not transparent to one another regardless of which PATTERN has been selected.



**FIGURE 1.26.**

**FILLED SHAPES** are drawn like **HOLLOW SHAPES** but are automatically filled with any of the 38 **PATTERNS**.

1. Select **FILLED RECTANGLE**.
2. Select a **PATTERN**.
3. Select **BORDER LINE WIDTH**.
- 4-5. Draw **RECTANGLE A**.
6. Select solid white **PATTERN**.
- 7-8. Draw **RECTANGLE B**.
9. Select new **PATTERN**.
10. Select dotted **BORDER LINE WIDTH**.
- 11-12. Draw **RECTANGLE C**.

Notice each succeeding **FILLED RECTANGLE**, including the white **FILLED RECTANGLE**, overlaps and conceals portions of previously drawn shapes. This implies that some drawings would best be built from background to foreground.

Try a few **HOLLOW SHAPES** so that they overlap the **FILLED SHAPES**. Notice the difference between a **HOLLOW SHAPE** and a white **FILLED SHAPE**. Draw separately, the two **RECTANGLES** appear identical. Draw them overlapping one another and they behave quite differently.

When using the dotted **BORDER LINE WIDTH** (10) as in Rectangle C, the **FILLED SHAPE** will not show its border.

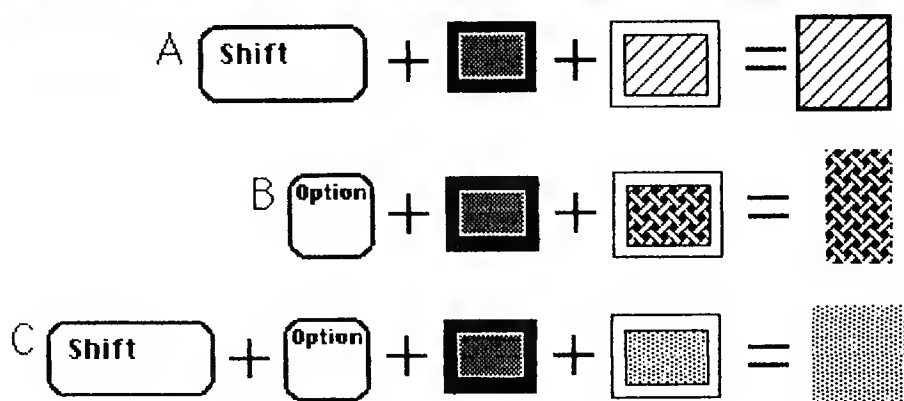
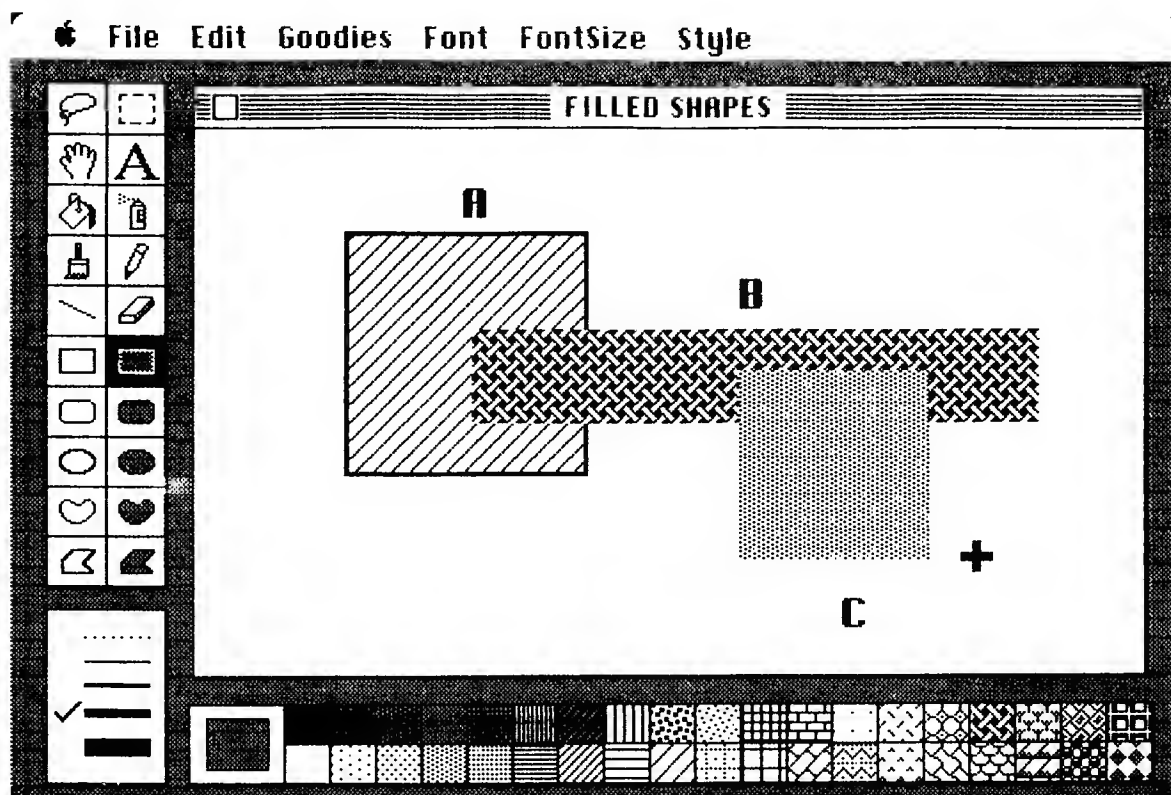


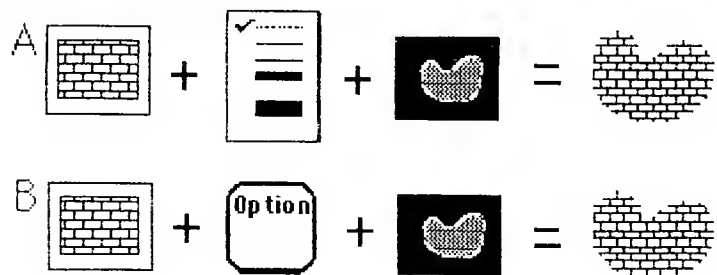
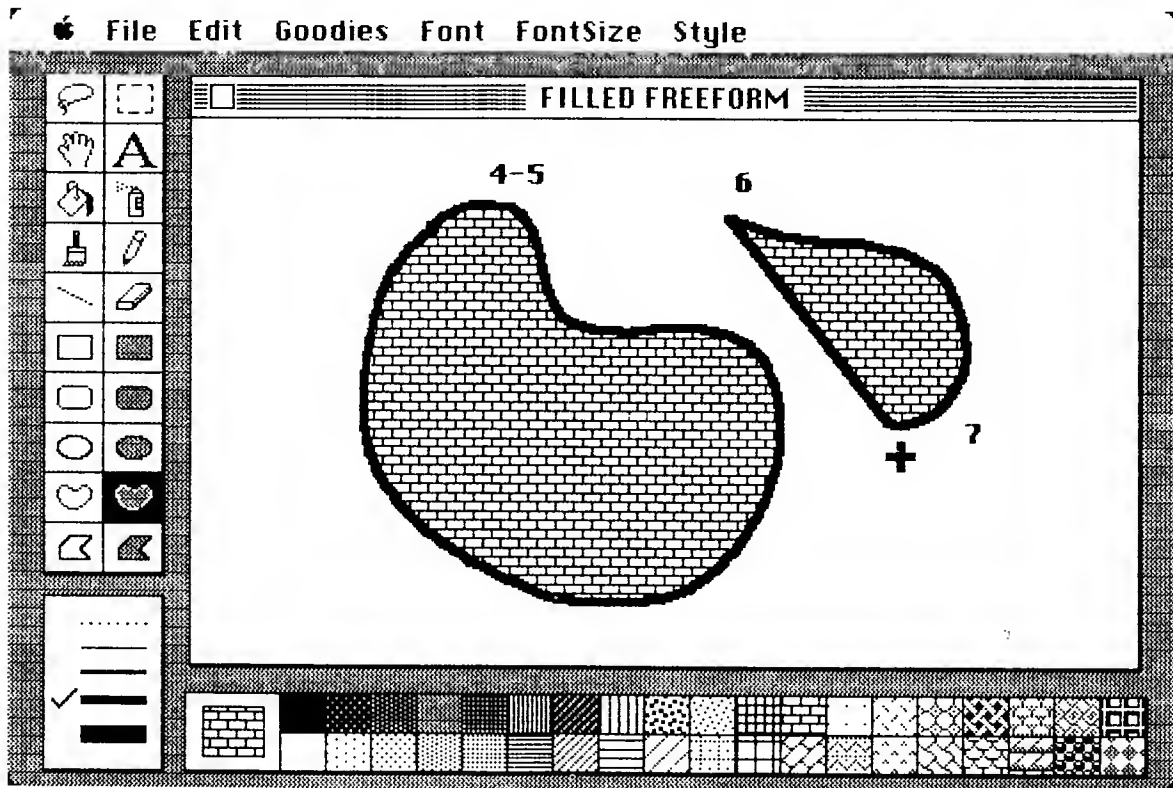
FIGURE 1.27.

Just as you created hollow **circles** and **squares** using the **SHIFT** key, you can create filled squares and filled circles. Figure 1.27 shows shapes created using the **SHIFT** key (A), the **OPTION** key (B), and both keys together (C).

The **OPTION** key puts the selected **PATTERN** in the shape's **BORDER LINE WIDTH** rather than in standard black. The **PATTERN** will be the same as the fill **PATTERN** for the **FILLED SHAPE**. This gives the shape the appearance of having no border (B).

When the **SHIFT** and **OPTION** keys are used together, the result is filled circles and squares with no borders regardless of selected **BORDER LINE WIDTHS** (C).

Although rectangles have been illustrated in the screen above, the principles apply to the **ROUND-CORNERED RECTANGLES** and **OVALS** as well.



**FIGURE 1.28.**

**FILLED FREEFORM** shapes are drawn like **HOLLOW FREEFORM** shapes.

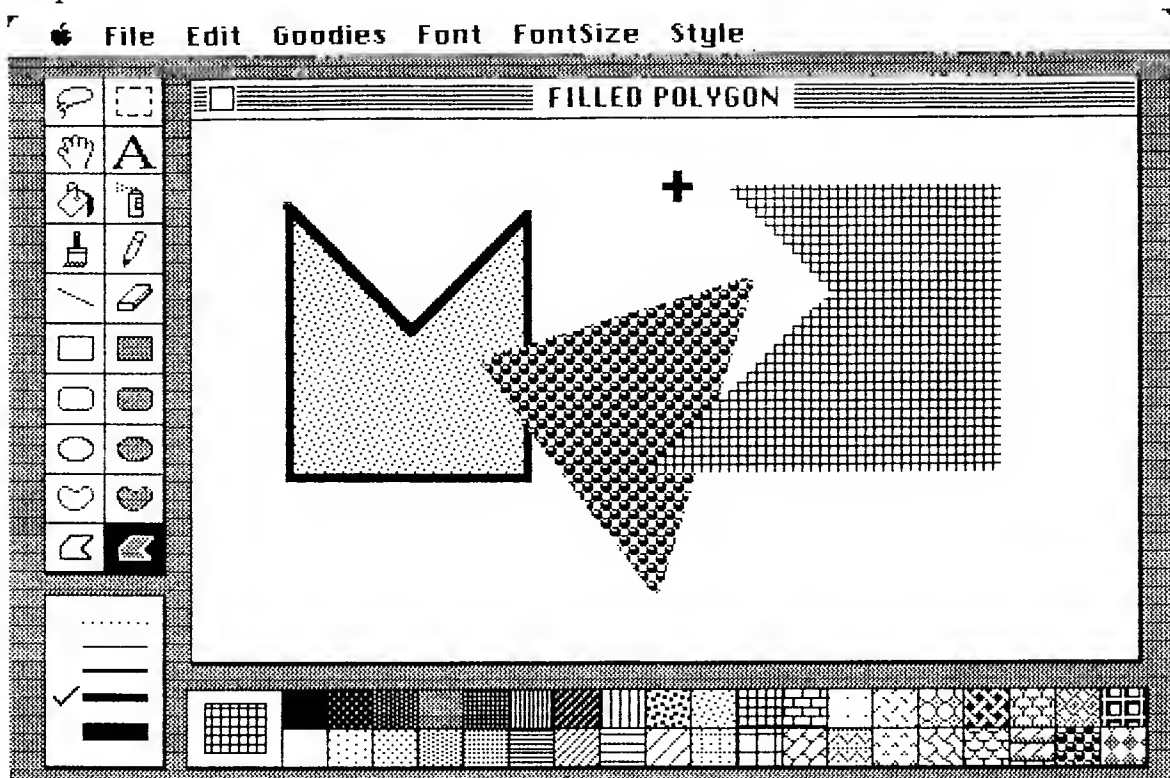
1. Select **FILLED FREEFORM** icon.

2. Select a **PATTERN**.
3. Select **BORDER LINE WIDTH**.
- 4-5. Draw a **FREEFORM** shape.
- 6-7. Draw part of a **FREEFORM** shape releasing the mouse button before the shape is complete.

**FILLED FREEFORMS** will not let you draw a line. If you do not drag the pointer to the beginning point of the **FREEFORM**, MacPaint automatically draws a line to the beginning point when you release the mouse button. This is what occurred in step 7, then the shape filled in.

As with all **FILLED SHAPES**, use of the dotted **BORDER LINE WIDTH** will give the appearance of a **FILLED SHAPE** without a border (A). Using the **OPTION** key has the same effect (B).

Double clicking and the **SHIFT** key have no consequence on **FREEFORM** shapes.



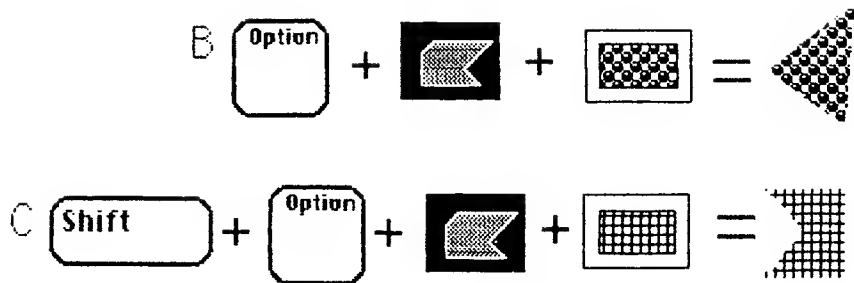


FIGURE 1.29.

A FILLED POLYGON is drawn like the HOLLOW POLYGON. You must click the mouse at each bend. Since the POLYGON sides follow the pointer everywhere on the screen you will usually need to double click to disconnect the POLYGON from the pointer.

Figure 1.29 shows the effects of the OPTION and SHIFT keys. Like the FILLED FREEFORM, the POLYGON cannot remain in the form of a line. Either you must enclose the POLYGON or it will automatically enclose itself before filling in.

The SHIFT key produces horizontal, vertical, and 45° lines (A). The OPTION key creates patterned borders (B).

This concludes our discussion of those icons whose main purpose is shape. Next we will discuss the uses of PATTERN.....



## PATTERN and Texture

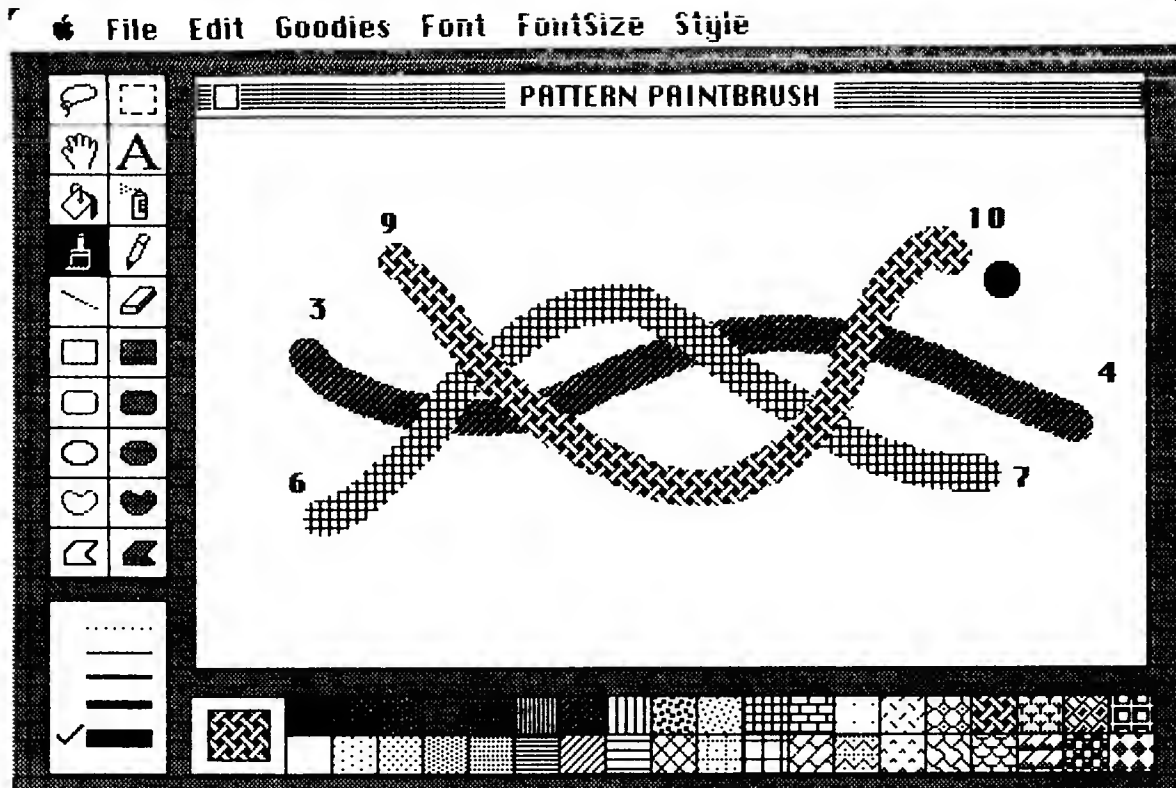
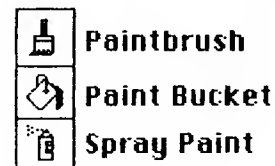


FIGURE 1.30.

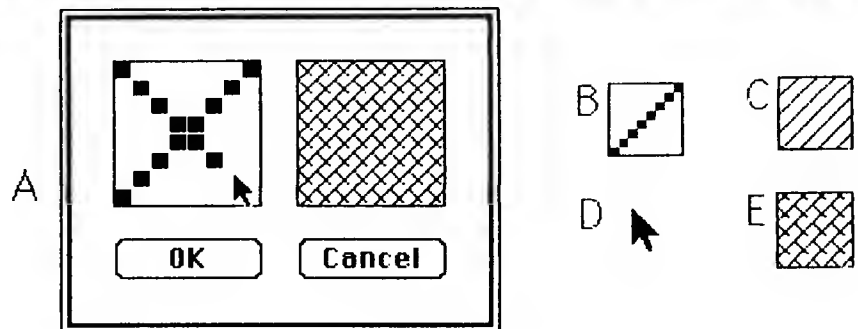
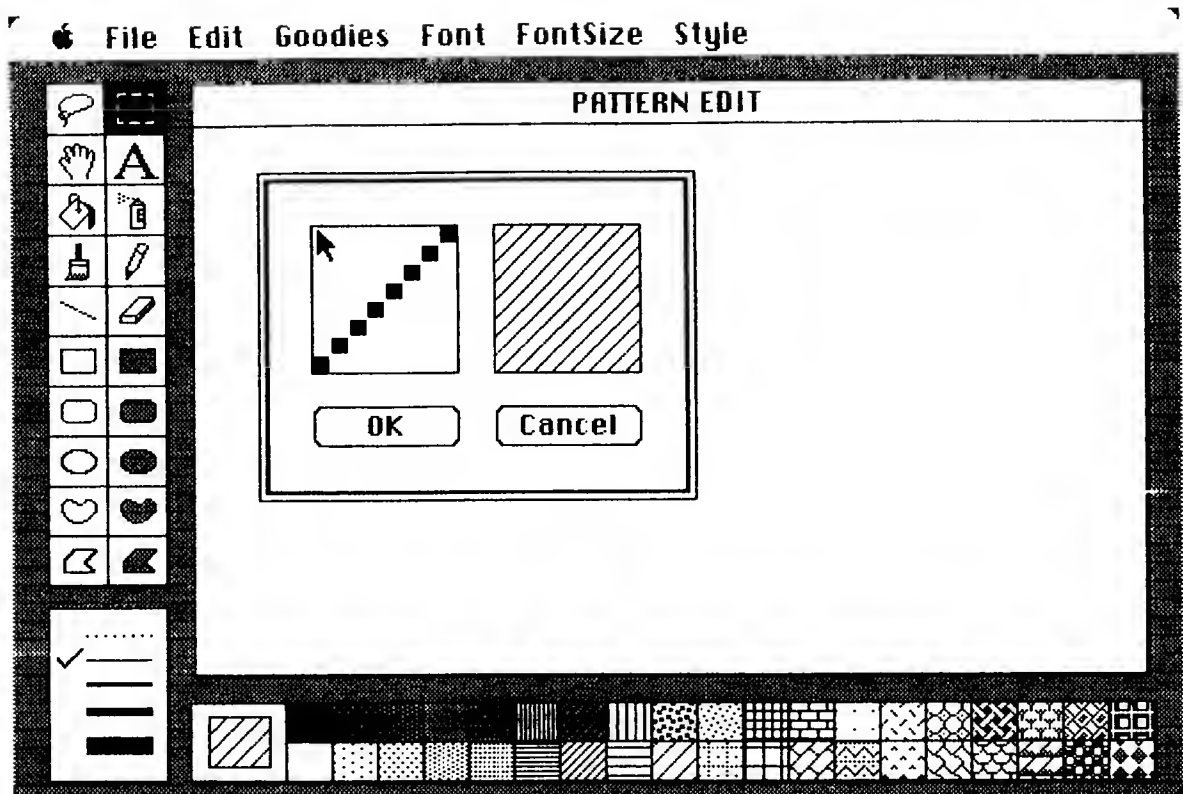
You have seen that SHAPES use PATTERN as fill and as borders. There are three other icons which also use PATTERN.



1. Select PAINTBRUSH.
2. Select striped PATTERN.
- 3-4. Draw a line by dragging the PAINTBRUSH.
5. Select a new PATTERN.
- 6-7. Draw a line.
8. Select another PATTERN.
- 9-10. Draw a line.

PATTERNS painted with the PAINTBRUSH are not transparent to one another. Instead, one PATTERN paints out other PATTERNS, lines, or shapes when using the PAINTBRUSH.

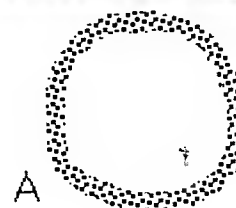
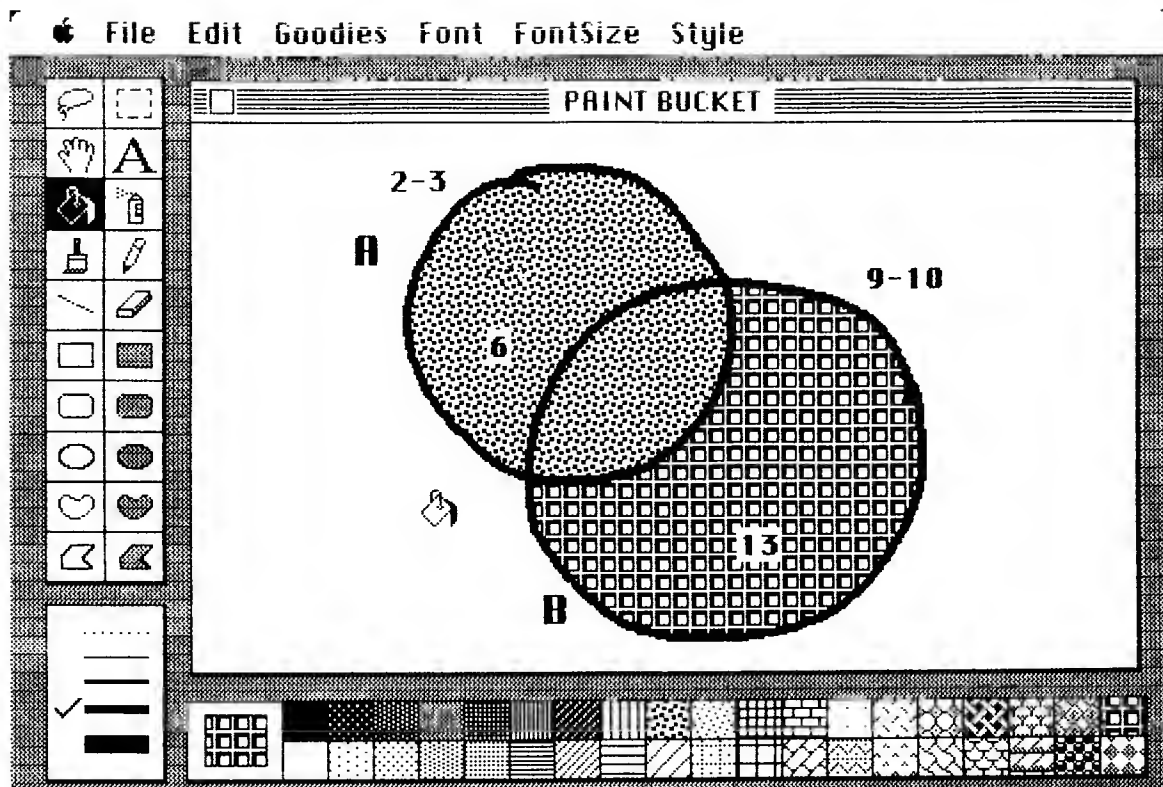
If 38 Patterns are not enough, you can create new PATTERNS. Just drag through the GOODIES menu until EDIT PATTERN is highlighted or double click the pointer over the PATTERN most closely representing a PATTERN you want to create. Figure 1.31 illustrates PATTERN editing procedures.



**FIGURE 1.31.**

In Figure 1.31, the left box holding square dots shows an enlarged version (A) of the PATTERN in the right box (B). This is also the PATTERN shown in the PATTERN indicator (C). The pointer is used to click the square dots in or out of the left box (D). As changes are made in the left box, they will be reflected in the right box (E). Figure 1.31 A shows the results of clicking in a new diagonal line of dots. When you have created the desired PATTERN, select “OK”. This places the new PATTERN in the PATTERN palette and indicator. “Cancel” returns you to the drawing screen without changing the PATTERN.

PATTERN changes will be saved with the drawing document on which you are currently working. When beginning a new document, the PATTERN palette will default to those original PATTERNS shown in Figure 1.31.



**FIGURE 1.32.**

PAINT BUCKET can be used to fill any enclosure with any PATTERN.

1. Select PAINTBRUSH.
- 2-3. Draw Circle A.
4. Select a PATTERN for Circle A.
5. Select PAINT BUCKET.
6. Fill Circle A with PATTERN.
7. Select PAINTBRUSH.
8. Select black PATTERN for PAINTBRUSH.
- 9-10. Draw Circle B.
11. Select a new PATTERN.
12. Select PAINT BUCKET.
13. Fill Circle B with PATTERN.

If step 8 had been skipped, Circle B border would have looked like Figure 1.32 A. Interesting, but Figure 1.33 shows the results of pouring paint into such a circle.

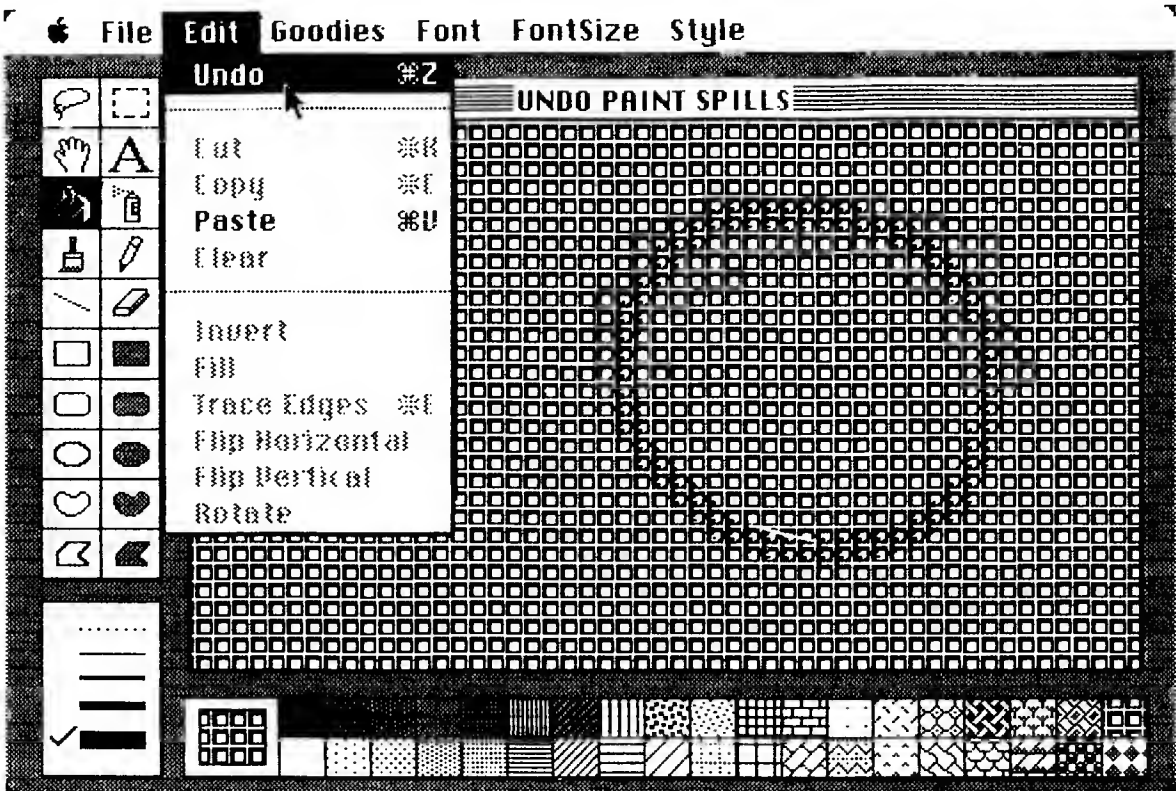
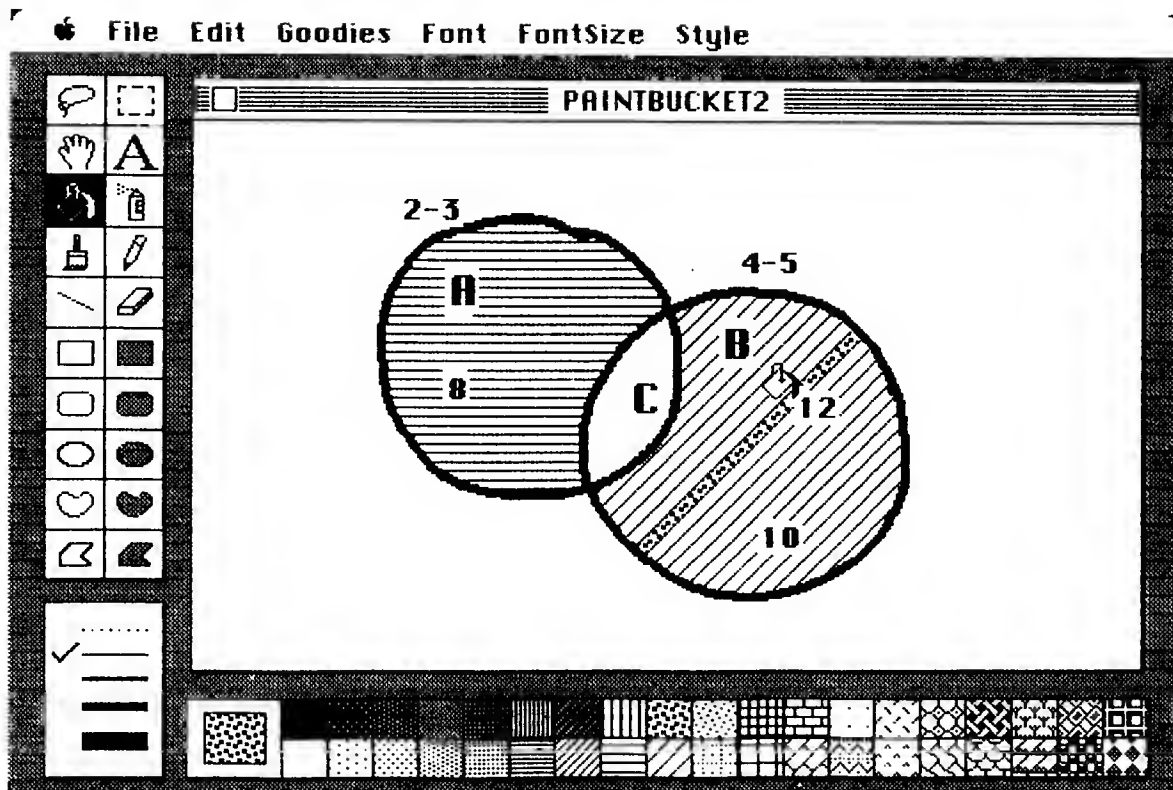


FIGURE 1.33.

The PAINT BUCKET spreads its PATTERNED paint until the paint finds a complete enclosure, which may be the entire window. If only one dot is missing from an enclosure, the PAINT BUCKET will spill its paint.

To UNDO a paint spill (or remove the PATTERN), go immediately to the EDIT menu. Drag the cursor down to UNDO and release the mouse button. UNDO will reverse the most recent screen addition. If you UNDO twice in succession, the spilled paint will be returned. But you can reselect UNDO to mop the paint up again. This is a very good way to test any paint PATTERN before making a final decision on the effects of a particular PATTERN on a drawing.



**FIGURE 1.34.**

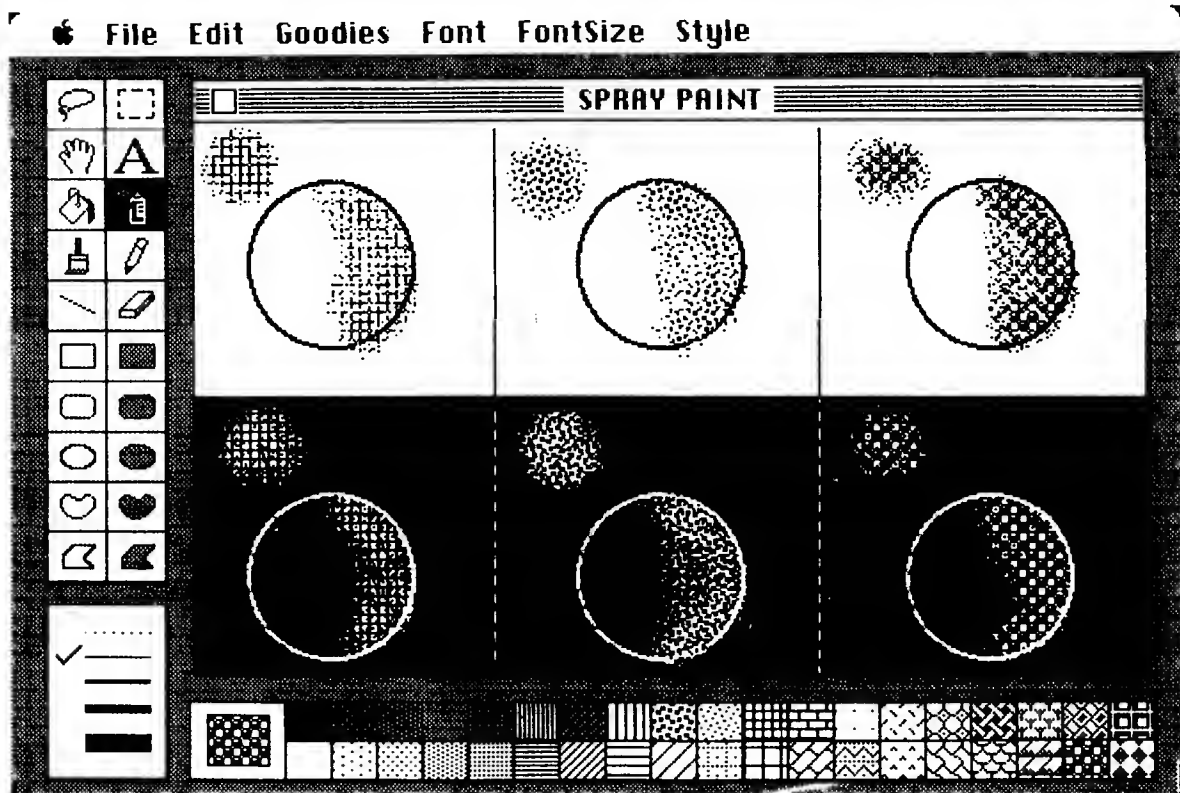
PAINT BUCKET can be used to place PAT-  
TERN within another PAT-  
TERN. The first drops  
of paint pouring from the bucket (A) and a steady  
mouse are the keys to painting very small enclosed  
areas.



1. Select PAINTBRUSH.
- 2-5. Draw two overlapping circles.
6. Select PATTERN for circle A.
7. Select PAINT BUCKET.
8. Paint Circle A by clicking the PAINT BUCKET inside the circle.
9. Select wide stripe PATTERN for circle B.
10. Paint Circle B.
11. Select new PATTERN.
12. Paint PATTERN within striped PATTERN.

The PAINT BUCKET will fill in only one enclosed area at a time. When  
all shapes are drawn first and filled in later, unpatterned areas such as area C

result. You may prefer to fill in with **PATTERN** as you draw as in Figure 1.32. If you fill in area C with one of the selected striped **PATTERNS**, the stripes will automatically line up with those in the adjacent circle. When new **PATTERNS** do not line up with existing **PATTERNS**, the earlier patterned image has probably been moved or pasted with other icons, **LASSO** or **MARQUEE** (see pages 45-50, **LASSO** and **MARQUEE**).



**FIGURE 1.35.**

**SPRAY PAINT** is used to give texture or shading to drawings using any **PATTERN** from the **PATTERN** palette. If you spray continually in one spot the complete **PATTERN** will result. Or, you can spray one **PATTERN** over another generating some very subtle shadings. You can also **SPRAY PAINT** white on black.

1. Select a **PATTERN**.
2. Select **SPRAY PAINT**.
- 3-4. Spray paint by dragging **SPRAY PAINT**.

The above screen was created using tools and techniques introduced in earlier examples.

1. Divide screen in half using **PENCIL** and **SHIFT** key.
2. Fill lower screen with black **PATTERN** using **PAINT BUCKET**.

3. Divide screen in thirds using PENCIL and SHIFT key. To change lead from black to white or white to black, press and release mouse button without sliding mouse controller when PENCIL enters changed background.
4. Circles drawn using HOLLOW OVAL. Circles in black portion used OPTION key, HOLLOW OVAL, and solid white from the PATTERN palette.

This concludes our discussion of PATTERNS. Next you will see how to incorporate text into your drawings....

## Text

The TEXT icon's capabilities should not be mistaken for word processing. Although TEXT uses letters from the keyboard, each letter is a form of graphics and should not be viewed any differently from other forms of graphics. The TEXT icon is for labels, headings, and captions. Using different combinations of FONT, FONTSIZE, and STYLE from the menu bar, there are nearly 2000 styles of lettering (A-C).

Features in FONT, FONTSIZE, and STYLE are selected by dragging the arrow down through the menu and releasing the mouse when the desired feature is highlighted. Selected features in the menus will have check marks beside them. To deactivate a feature in STYLE, reselect the checked feature or select PLAIN to deactivate all features except the ALIGN features.

Figure 1.36-A shows some of the possible FONTS available to MacPaint. It is not convenient to have every FONT on your MacPaint disk since this requires a great amount of disk storage space. Adding and deleting the various FONTS to MacPaint is described in Appendix C.

Numbers in outline form in FONTSIZE menu, 12, for example, indicate the most readable, least distorted FONTSIZE for the selected FONT (Figure 1.36-B). Some FONTS, such as Geneva, are suitable in several FONTSIZES.

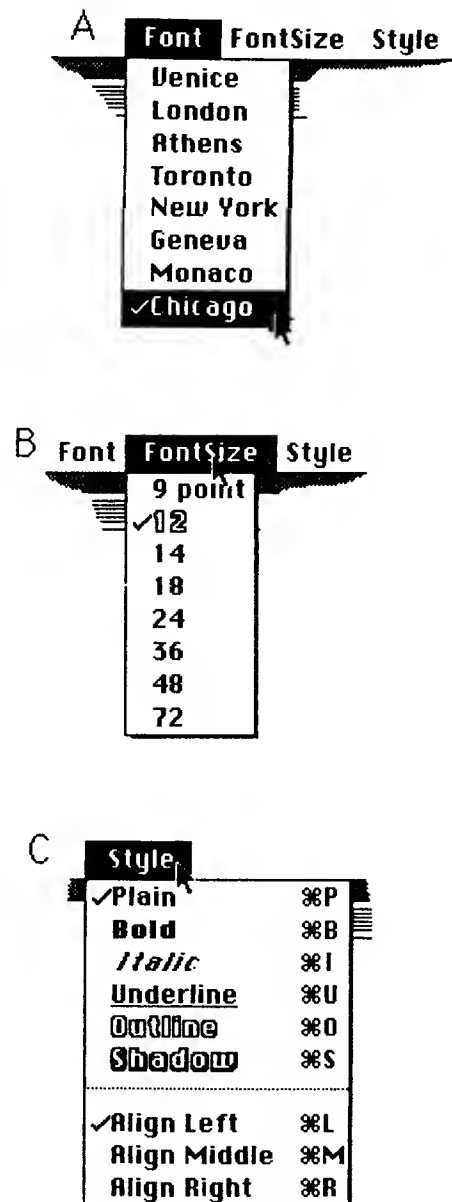


FIGURE 1.36.



**FIGURE 1.37.** Insertion bar used as a pointer to place **TEXT** in drawings.

Click the insertion bar (Figure 1.37) to insert the blinking bar | anywhere on the screen. This is where **TEXT** will be inserted. Anytime you click the mouse, the blinking bar will move to the insertion bar. Between the time you click on the blinking bar and the time you click it off again, the **FONT**, **FONTSIZE**, and **STYLE** can be changed. The changes will affect all **TEXT** entered since the last time the blinking bar was clicked. Try typing in some text now. After entering the type, don't click the mouse while the insertion bar is on the drawing screen. Instead, move the pointer into the **FONT** menu and drag to another **FONT**. Notice that the text you entered will change to the newly selected **FONT**. Do the same thing with **FONTSIZE** and **STYLE**. Once you have decided on a text you like, then click the insertion bar while it's on the drawing screen.



Rather than dragging through the **FONT** and **FONTSIZE** menus while trying out various typefaces, try this shortcut. For changing **FONTSIZE**, press the **COMMAND** key, and the "</," or ">/." key. For testing out various **FONTS**, press the **COMMAND** key, the **SHIFT** key and the "</," or ">/." keys.

 +  or  = **FontSize change**

 +  +  or  = **Font change**

To change **FONT**, **FONTSIZE**, or **STYLE** for emphasis in the middle of a caption, bring the insertion bar over the top of the blinking bar and click. This keeps your **TEXT** aligned when changing **FONT**, **FONTSIZE**, or **STYLE**. **TEXT** can be difficult to line up, especially when you want to change the typeface. To minimize this problem, use the cross bar on the insertion bar as a guide. This is where the bottom of the letter sits.



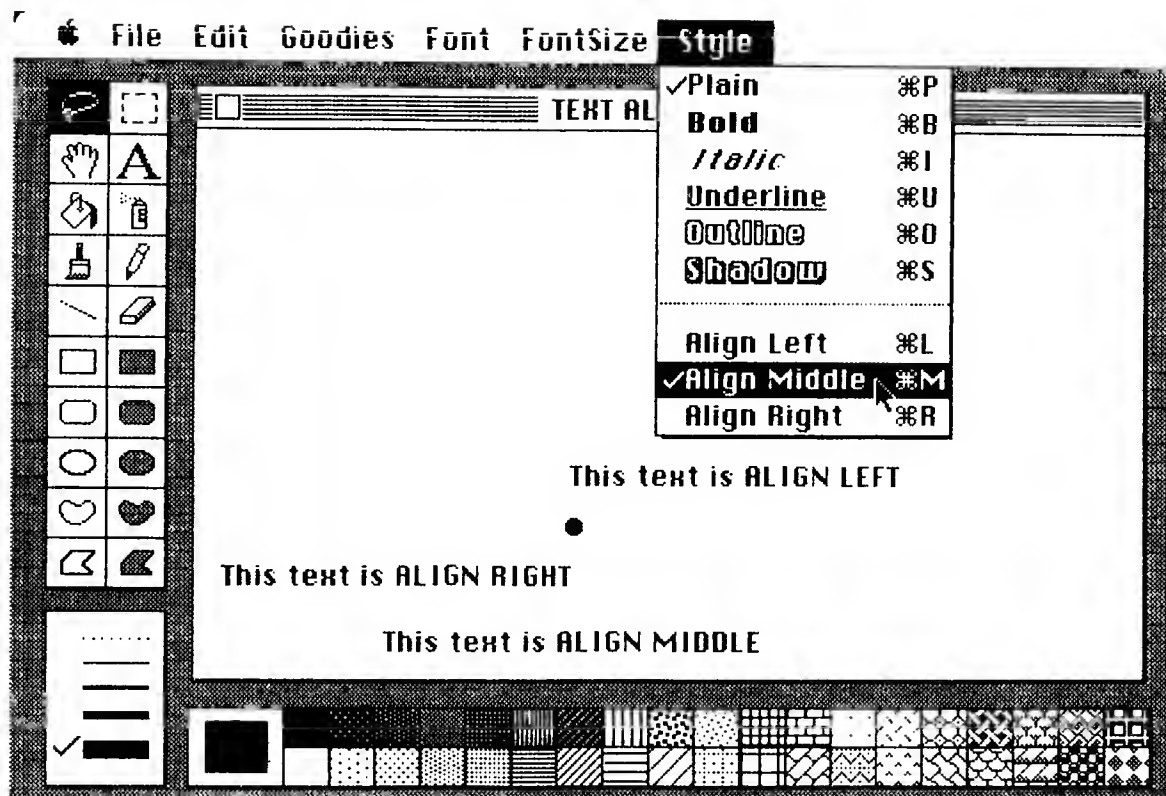


FIGURE 1.38

The best way to learn how ALIGN operates is to perform a test as shown in Figure 1.38. Place a heavy dot on the screen with the PAINTBRUSH. The dot serves as a reference point for each ALIGN feature you will be trying. After selecting an ALIGN feature, position the TEXT blinking bar near the dot, then type a phrase. Watch where the TEXT appears with respect to the dot and blinking bar. Repeat this for each ALIGN feature.

Try out the shortcuts shown in Figure 1.38. While TEXT icon is activated, you can change STYLES and alignment features by pressing the COMMAND key and one of the letters in the right hand column of the menu. You may find using the keyboard faster than dragging through the menu.

Figure 1.39 illustrates how you might use the three alignment features when labelling.

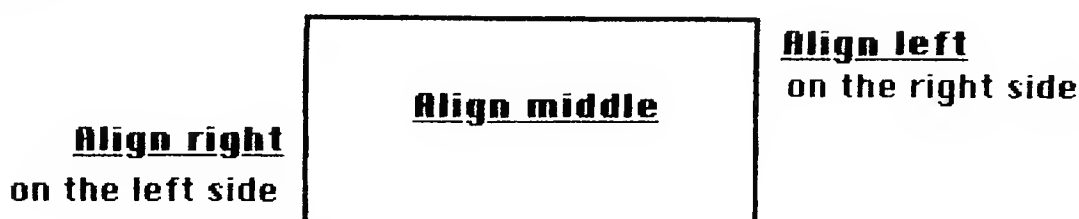


FIGURE 1.39. ALIGN features used to label a box.

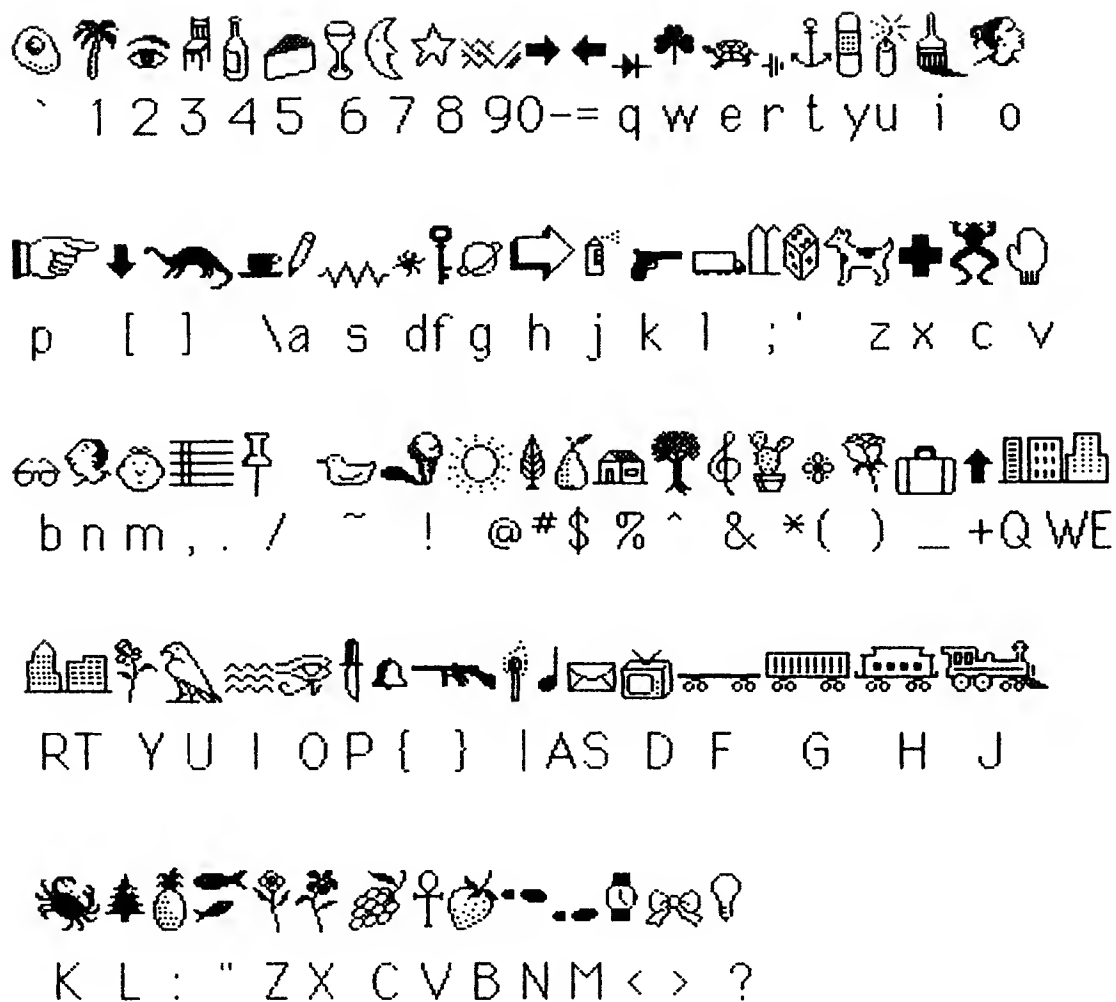


FIGURE 1.40. CAIRO FONT chart.

The latest FONT addition is CAIRO. CAIRO is 94 miniature drawings represented by each key on the keyboard using upper-case (Caps Lock) and lower-case letters, numbers and symbols. You can enlarge the drawings up to 72 point FONTSIZE. Then, using other MacPaint tools, you can add texture and shading. Figure 1.40 displays the CAIRO drawings and the keys used to create the drawing.

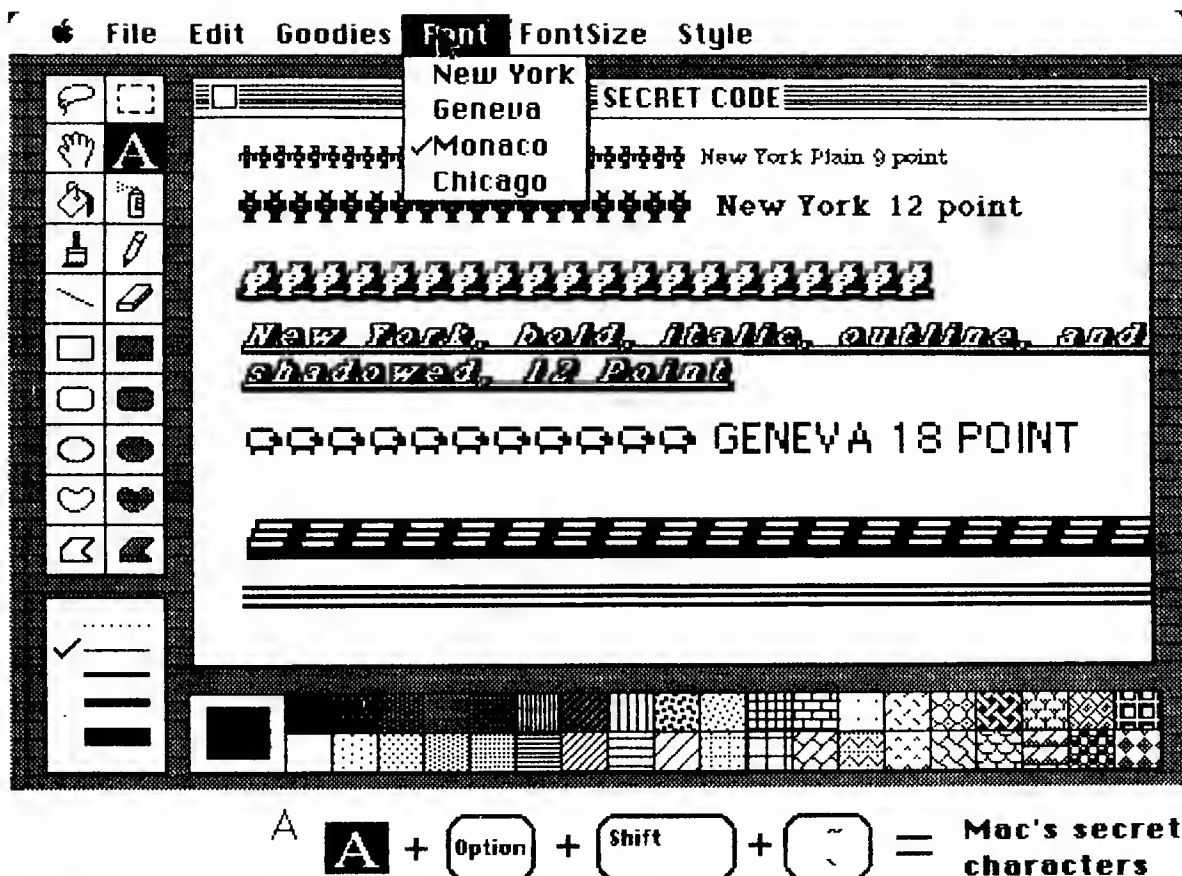


FIGURE 1.41. Secret code.

The TEXT icon is full of surprises. Try finding Mac's secret characters by pressing the OPTION, SHIFT and tilde/accent (~') keys.

This concludes our discussion about the TEXT icon and its many features. Next, let's look at the ERASER icon before we begin learning about MARQUEE and LASSO.....

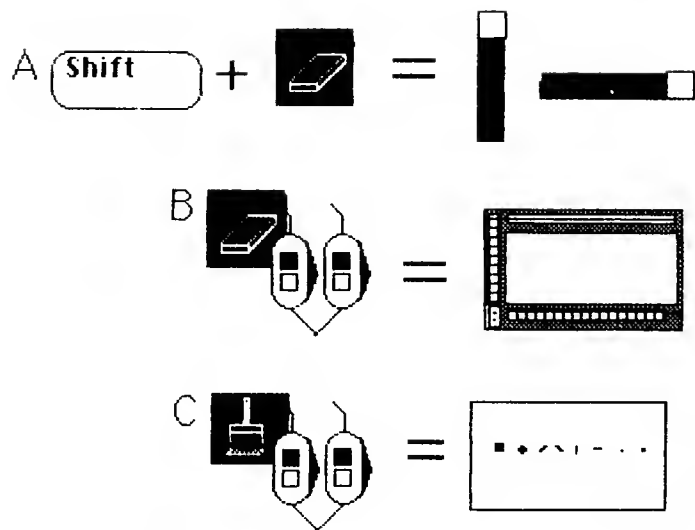
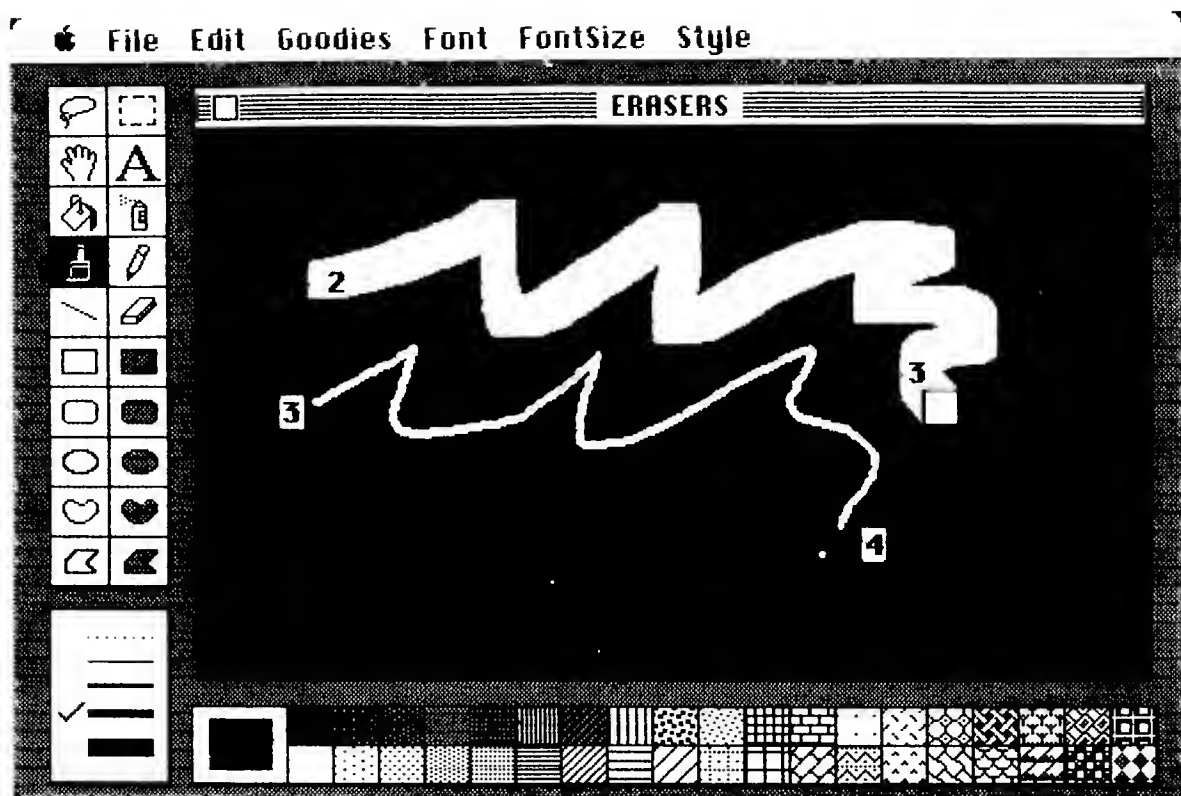



FIGURE 1.42.

## Erasing

There are several ways to erase mistakes in your drawing. The ERASER icon is one tool which performs the task of the Pink Pearl eraser. The ERASER'S path is about 1/4" wide and does not vary. The SHIFT key moves the ERASER in straight vertical and horizontal directions (A).

---

 Double clicking the ERASER will clear the drawing screen (B). If you accidentally clear the screen, the drawing returns by selecting UNDO.

---

For more detailed erasing, the PAINTBRUSH can be used with solid white chosen from the PATTERN palette. Since there are many brush sizes available, you can choose the size that suits your erasing details by double clicking the PAINTBRUSH (C). Anytime you have erased more than you intended, immediately select UNDO from the EDIT menu to UNDO the last erasure.

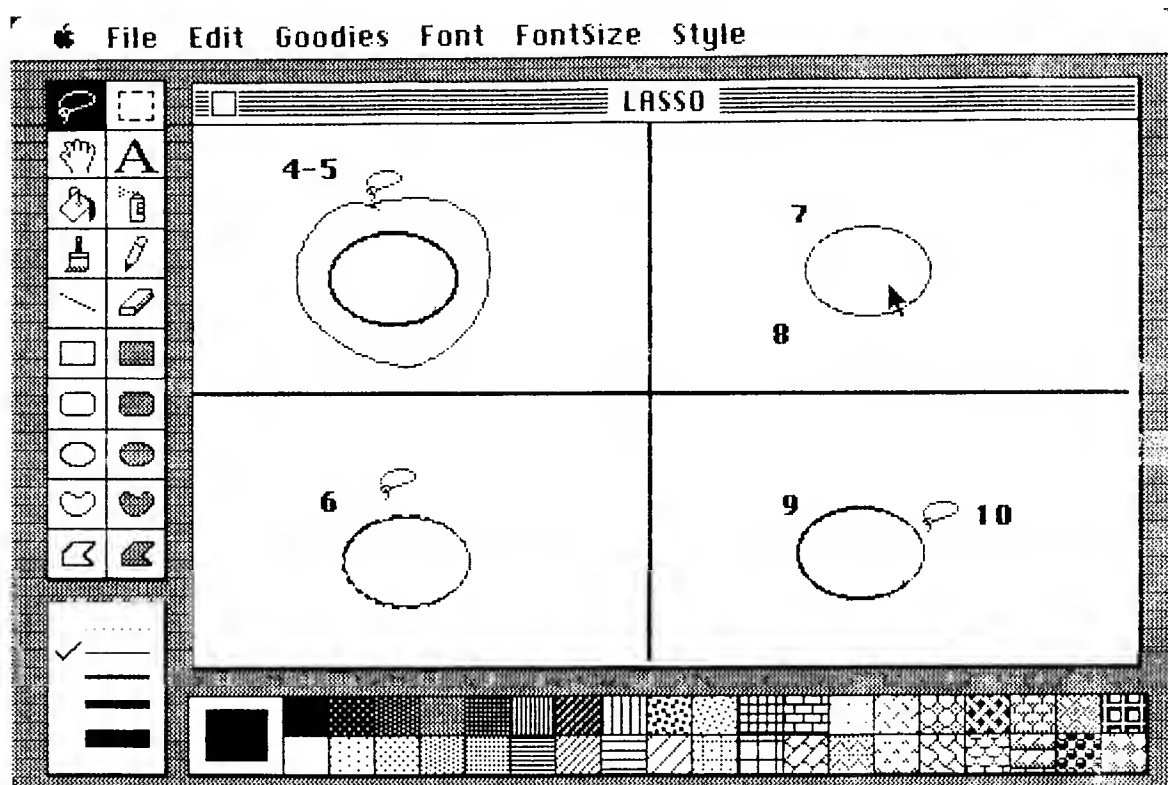


FIGURE 1.43.

## LASSOING and MARQUEEING

Now we are going to explore the LASSO and MARQUEE. These tools have many marvelous capabilities that can take a little time to discover and remember. But take your time. As we discuss the similarities and differences between these invaluable tools, you will be learning to cut and paste your drawings together effortlessly.

The LASSO and MARQUEE have three basic functions: selecting, moving, and copying. Let's examine each function separately with each icon beginning with the LASSO and selecting process.

- 1-2. Create one small HOLLOW OVAL.** Although there are four above, this is to illustrate the progression of steps.

To select the HOLLOW OVAL:

- 3. Click the LASSO icon.**
- 4-5. Drag the LASSO around the oval.**

The oval should now have a blinking line around it. The oval is now ready to be moved, copied, or have an EDIT feature applied to it. First, let's just try moving the oval to another spot on the drawing screen.

- 6-7. Move the LASSO over the blinking oval until LASSO changes into an arrow.**
- 8-9. Move the oval to a new location by dragging the arrow and oval.**
- 10. To release the blinking line, you must move the arrow away from the oval so that it changes back to a LASSO and click.**

Try moving the oval again. This time, after the oval has been moved, select UNDO from the EDIT menu. Be sure to try UNDO while the blinking LASSO is both on and off. It's always good to know when you can still backup before making a final drawing decision.

Now that you know how to select and move drawings around the screen, try the same procedure, but press the SHIFT key before dragging the drawing and arrow. You can release the SHIFT key after you begin dragging. When using the SHIFT key your drawing should move only in vertical or horizontal directions (A).



- 6-7. Without pressing the mouse button, move LASSO over blinking shape until LASSO changes to an arrow.
- 8-9. Pressing the OPTION key, drag a copy of the oval to its new location.
10. Move the arrow away from the blinking oval and click the mouse button to remove the blinking line.

The SHIFT key can be used at the same time the OPTION key is used. This moves copies in a straight vertical or horizontal direction (B). As long as the blinking line exists around the drawing, you can drag it several times to create several copies. However, another way to create multiple copies is to use the OPTION and COMMAND keys (C).

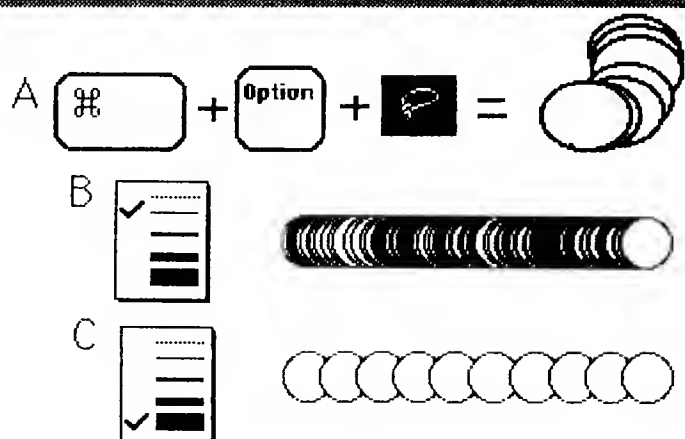
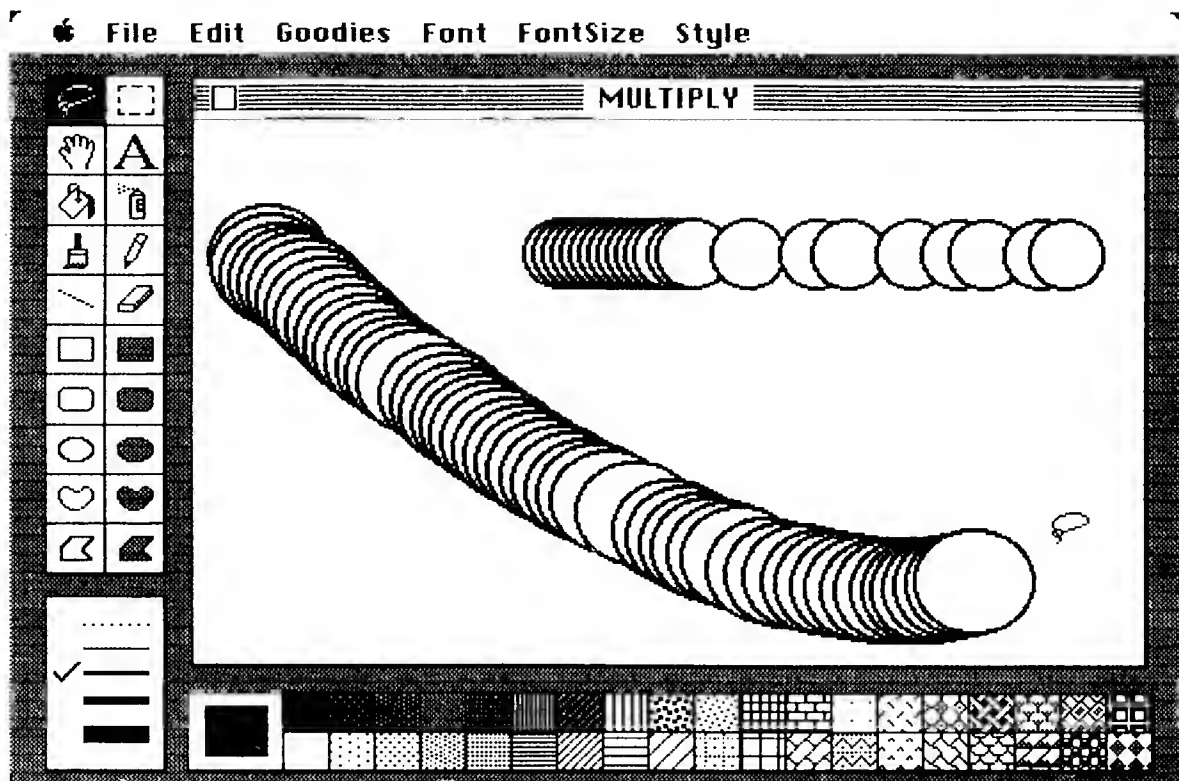






FIGURE 1.45.

Using the same procedure you used to make a copy, try making multiple copies with the **OPTION** and **COMMAND** keys pressed together (A). The **BORDER LINE WIDTH** and the speed with which you move the mouse controller across the table determines how closely spaced the shapes or figures are. The more slowly you move the mouse and the narrower the **BORDER LINE WIDTH** (B), the more closely stacked the figures become. The wider the **BORDER LINE WIDTH**, the wider apart are the images (C).

Besides moving and copying, you can use **LASSO** with the **BACKSPACE** key or several other features from the **EDIT** menu. The **BACKSPACE** key will remove anything within the blinking **LASSO** (D), a very good way to quickly erase large drawings. Applicable features from the **EDIT** menu are: **CUT**, **COPY**, **PASTE**, **CLEAR**, **INVERT**, and **FILL**. The **EDIT** menu features are fully discussed separately beginning on page 64. However, if you'd like a head start, drag through the **EDIT** menu and select some of these features while the blinking **LASSO** surrounds your drawing.

Experiment with **LASSO** and its many features by selecting **UNDO** during the drawing exercises.

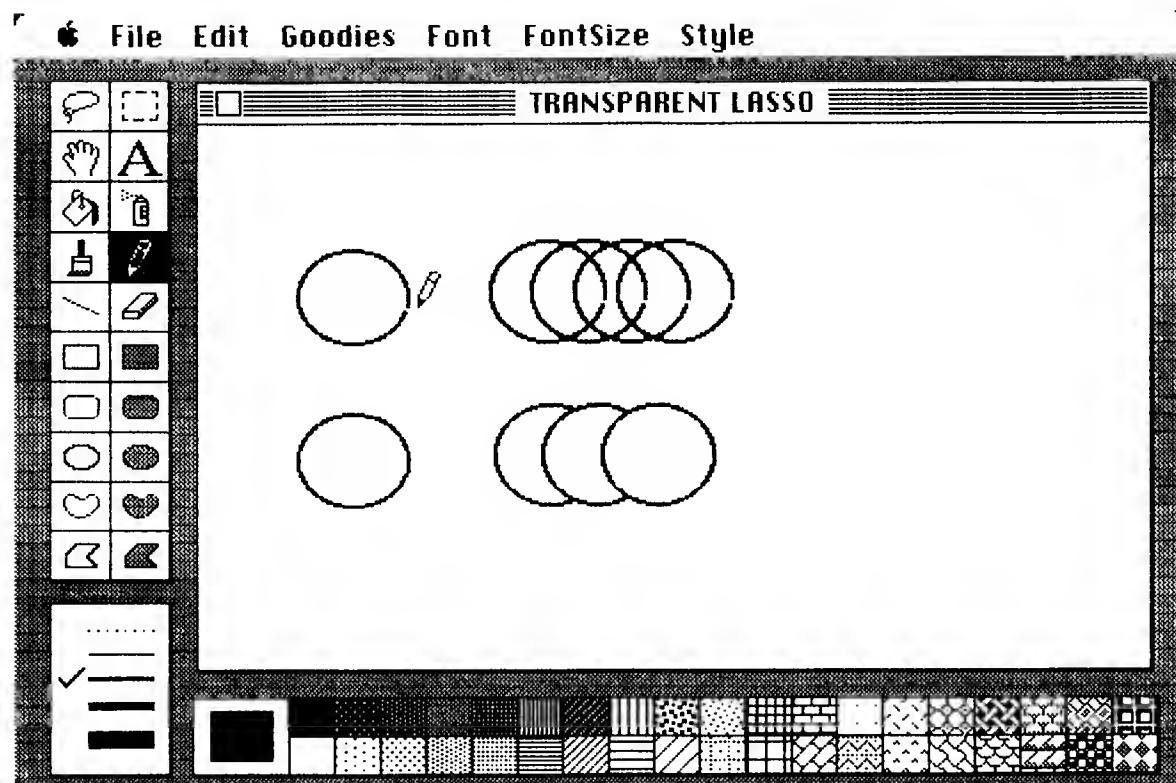



FIGURE 1.46.

 When a shape is not entirely enclosed, even with one dot missing, the shape will appear transparent rather than solid when moved over other lines and shapes. When you want to see through overlapping shapes, remove a dot by clicking the PENCIL on an outside line so that the shape is not entirely enclosed. Then LASSO and move the drawing. After using the LASSO, replace any missing dots or lines.

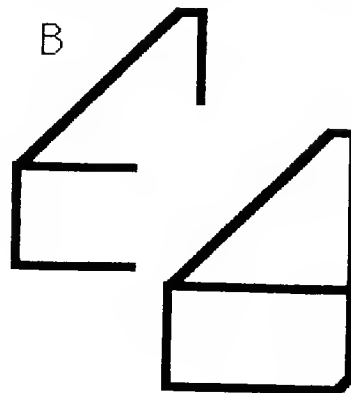
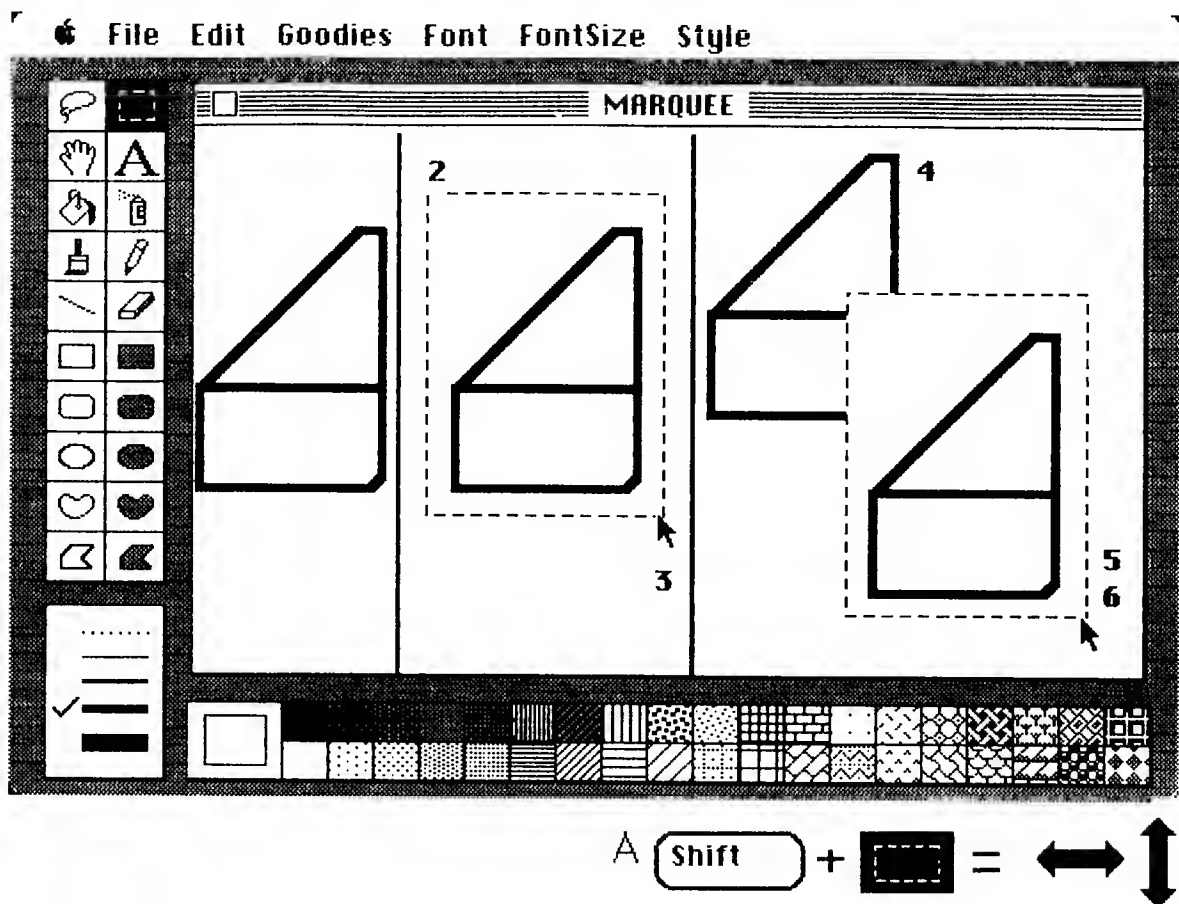


FIGURE 1.47.

The MARQUEE is very similar to the LASSO. You can use it to select, move, and copy drawings. A more important function of the MARQUEE is enlarging or reducing drawings and its use with the EDIT features. For this example, draw a HOLLOW POLYGON (Figure 1.47 shows four polygons but only one is drawn for the procedure). The following steps show how the MARQUEE is used to copy images.

1. **Select the MARQUEE.**
- 2-3. **Draw the MARQUEE by dragging the pointer diagonally as though you were drawing a HOLLOW RECTANGLE**—this time, there will be a rectangular blinking MARQUEE.
- 4-5. **With the arrow inside the MARQUEE and the OPTION key pressed, move the MARQUEE and the POLYGON to a new location**—without OPTION, the original polygon will be relocated but not copied.
6. **Move the arrow outside the MARQUEE and click to remove the blinking line.**

Like LASSO, the SHIFT key moves MARQUEE vertically or horizontally (A). Notice that, unlike the LASSO, the MARQUEE does not hug the drawn shape. This is one difference between the LASSO and the MARQUEE. The MARQUEE picks up all background within its blinking boundary and transports it to its new location. The background within the MARQUEE is solid when laid over parts of other drawings. Figure 1.47-B demonstrates the results of moving a copy of the polygon as occurred in steps 4-6.

The SHIFT key applies to the MARQUEE just as it does many other icons. Drawings will move only in a vertical or horizontal direction. The OPTION and COMMAND keys, on the other hand, are not usually successful in creating multiple copies. This is due to the solid background that the MARQUEE picks up as discussed previously. The solid background tends to wipe out the multiple copies as the MARQUEE is moving along the screen. You will have to experiment with the OPTION/COMMAND keys and MARQUEE since the results depend on the object drawn and the direction the MARQUEE is moving across the screen.



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**Double clicking the MARQUEE will select the entire drawing screen.**

---

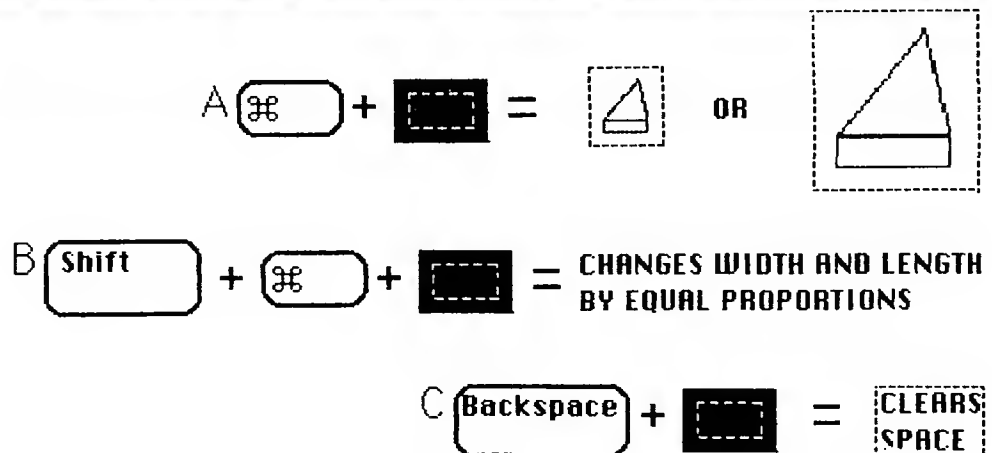
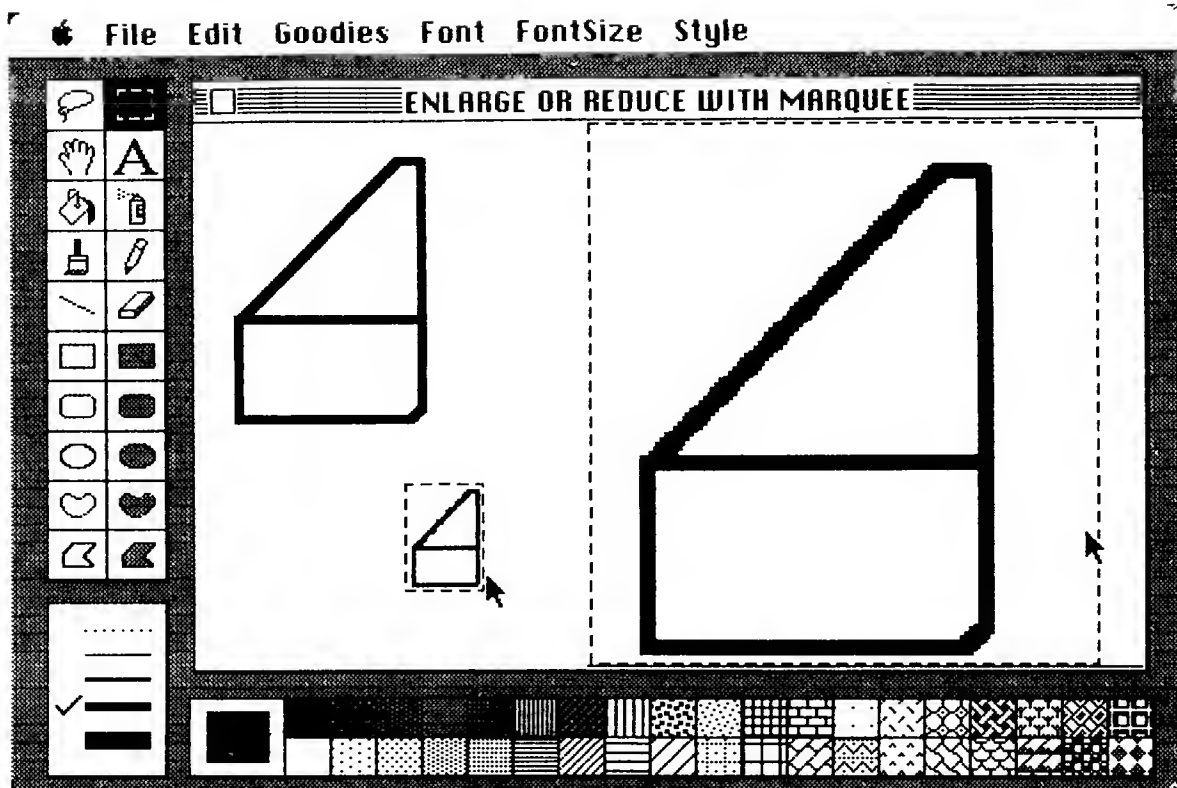
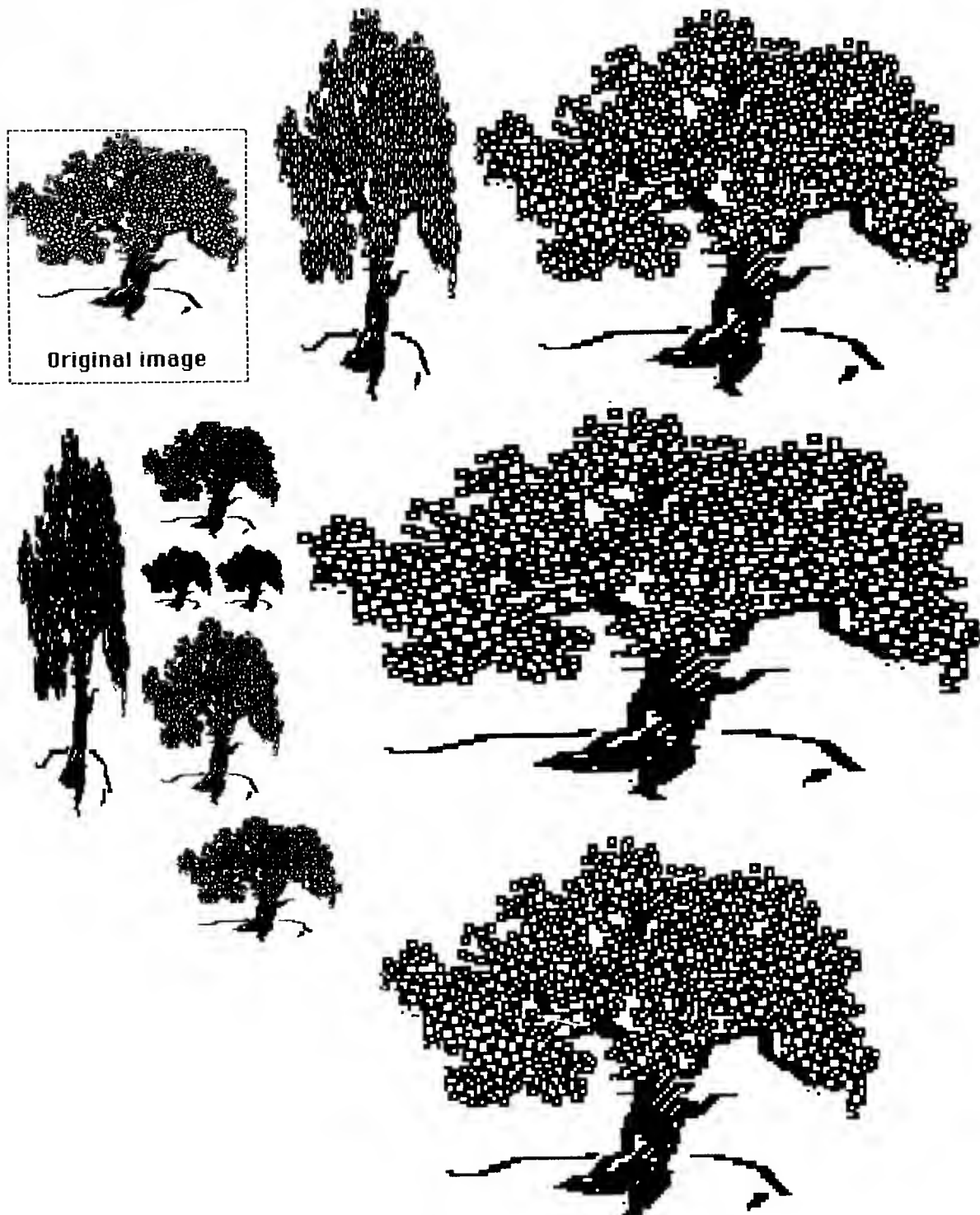


FIGURE 1.48.

The MARQUEE can be used to enlarge or reduce portions of a drawing (A). After selecting with the MARQUEE, just press the COMMAND key slightly ahead of the mouse button and drag the MARQUEE. Moving the arrow toward the center of the MARQUEE will shrink the MARQUEE'S contents. Pulling the arrow away from the MARQUEE'S center enlarges the MARQUEE'S contents. Using the SHIFT and COMMAND keys with MARQUEE will enlarge or reduce the width and length of a drawing in equal proportions. Figure 1.49 shows the effects of MARQUEE'S elasticity.

The BACKSPACE key will clear out anything within the MARQUEE (C).

The MARQUEE'S applicable features from the EDIT menu are: CUT, COPY, PASTE, CLEAR, INVERT, FILL, TRACE EDGES, FLIP HORIZONTAL, FLIP VERTICAL, AND ROTATE. Discussion of these features begins on page 64. But don't hesitate to try them out now if you are anxious.



**FIGURE 1.49.** These trees are all created from the original image using the *COMMAND* key, *MARQUEE*, and sometimes, the *SHIFT* key.

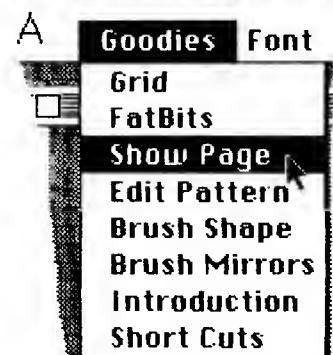
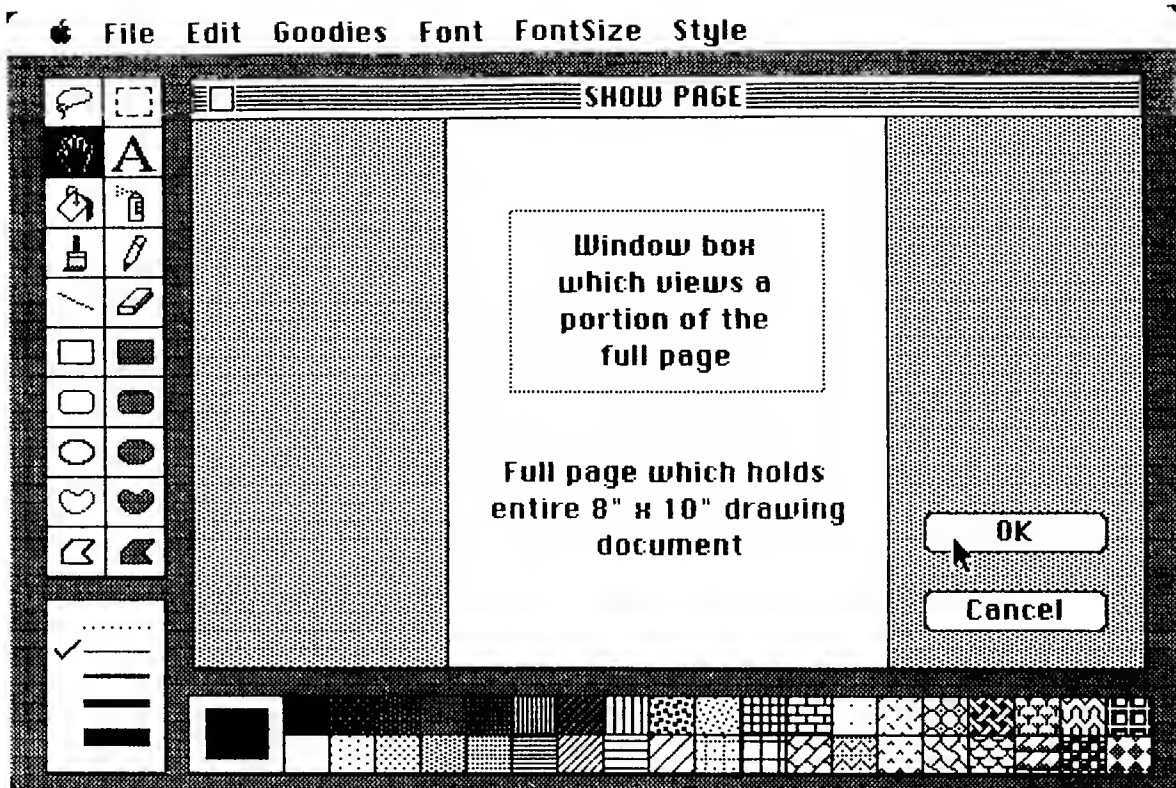
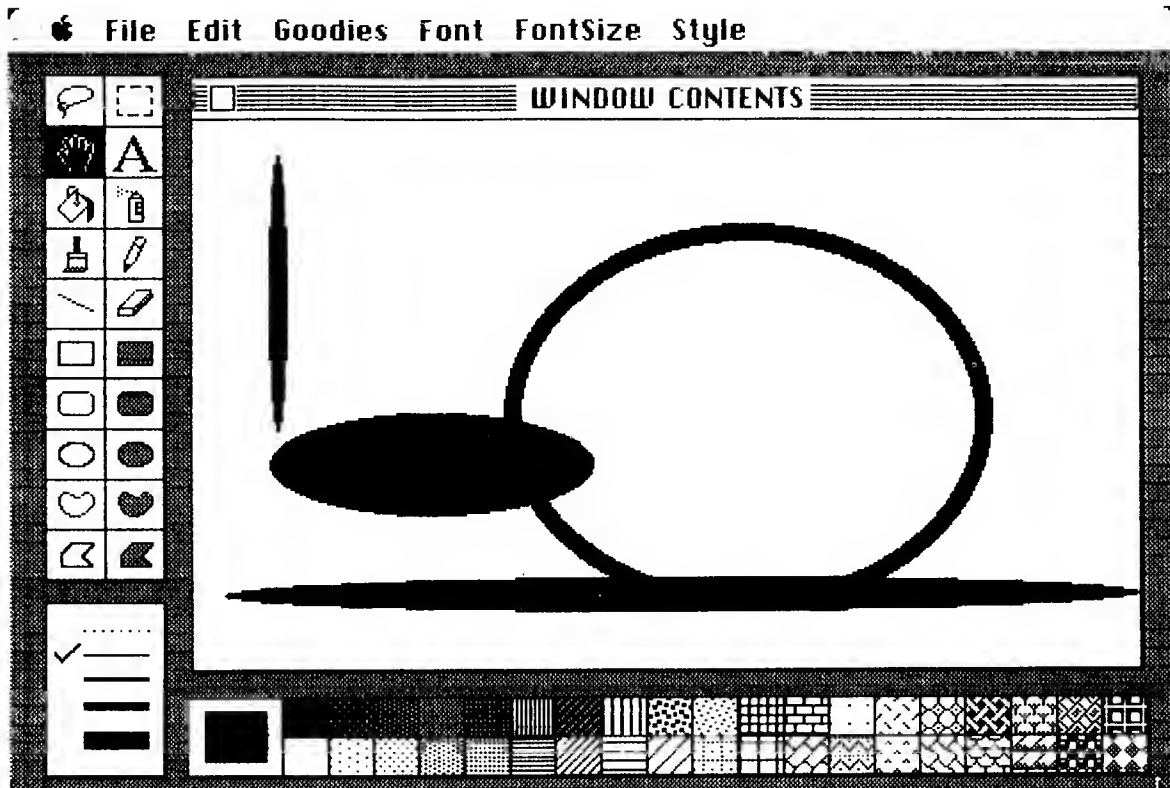


FIGURE 1.50

## Window Screen Functions

The SCROLL (or sometimes called GRABBER) is used to move the window up, down, or sideways. Looking at the screen, you are actually seeing less than one third of the available drawing space. Selecting the SCROLL icon and bringing it out on the screen allows you to move the window over the entire document. Although dragging the SCROLL icon across the screen appears to shove the screen image off the window, you are moving the window around an 8" x 10" page. Draw an oval on your screen. Select the SCROLL and drag it across the screen. Release the mouse when the drawing is positioned where you want it or when it will not move any farther. When using SCROLL on the normal drawing screen, the SCROLL icon will not let your drawing go off the full page. Try the SHIFT key with SCROLL. Once again, you will be confined to vertical and horizontal directions using the SHIFT key. After moving the window with the SCROLL, select UNDO. The window should return to its previous position.

Double clicking the SCROLL icon or dragging through the GOODIES menu (A) to SHOW PAGE gives you a miniature view of the full page at one time as Figure 1.50 shows. When viewing the full page you can move the window box around or you can move the entire page contents around. When the arrow is inside the window box and you are pressing and sliding the mouse, the window box moves to other areas of the page. If the arrow is outside the window box, you will be moving the contents of the page and not the window box. **In this mode, anything which slides off the page is erased once OK is clicked.** Cancel returns you to the normal drawing screen.



**FIGURE 1.51.** *HOLLOW and FILLED OVALS as you draw them on a normal window screen.*



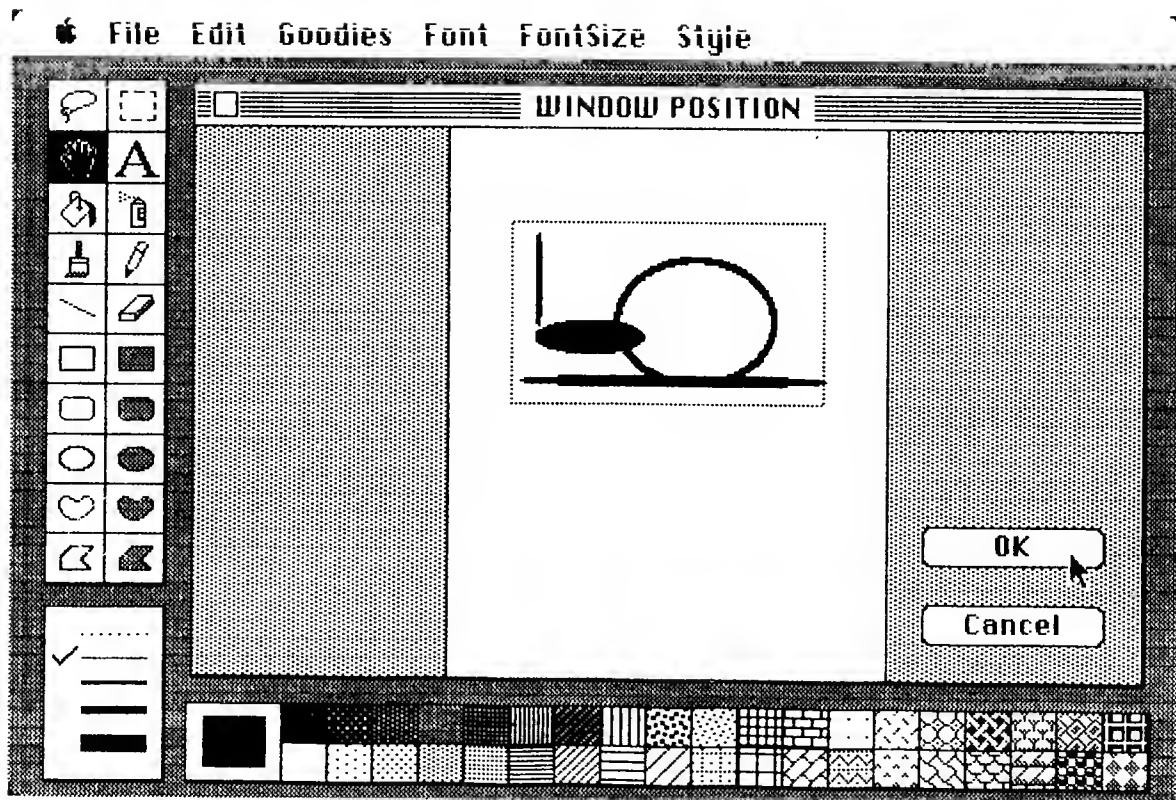


FIGURE 1.52. Drawing as it appears on a full page.

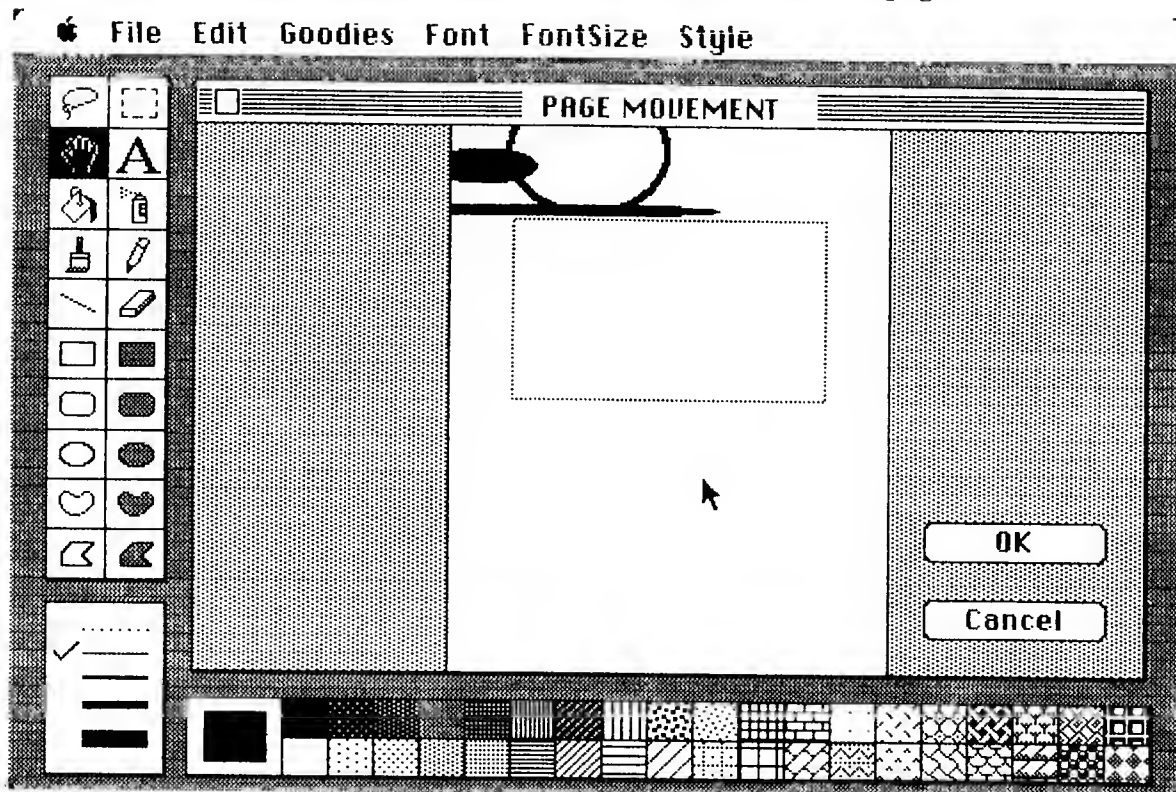


FIGURE 1.53.



Page contents can be moved when pressing and sliding the mouse if the arrow is outside the window box. Once you click OK you will have permanently erased information that has slid off the page (Figure 1.53).

The SHIFT key applies to the SCROLL icon while viewing the full page just as it did on the normal drawing screen. The SHIFT key will keep the window box moving in a straight, horizontal or vertical direction (A).

When drawings exceed one window screen on a document, you will need to see the full page often to see how the drawing is taking shape.

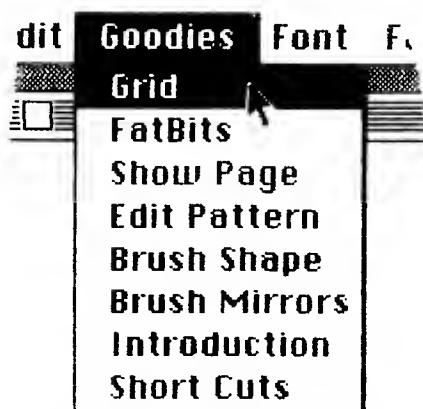
This concludes our discussion of window screen functions. Next, functions from the menu bar are presented.....

## ***Menu Bar Functions***

Features from the menu bar give the icons greater flexibility. Some of these features have already been introduced. For example, you are familiar with SHOW PAGE, EDIT PATTERN, and BRUSH SHAPE from the GOODIES menu. Presented in this section are the GOODIES features GRID, FATBITS, BRUSH MIRRORS, INTRODUCTION and SHORT CUTS. From the EDIT menu, CUT, COPY, PASTE, CLEAR, INVERT, FILL, TRACE EDGES, FLIP, and ROTATE are presented. From the APPLE menu, the SCRAPBOOK and CALCULATOR are discussed. Discussion of the FILE menu shows how to close and save your drawings. Let's begin with the GOODIES menu.

### **GRID**

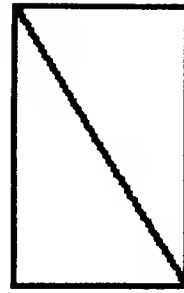
GOODIES has a feature called GRID. This is an invisible GRID that you click on and off by dragging through the GOODIES menu and releasing the mouse when the GRID is highlighted. The check mark indicates that the GRID is turned on. As long as the GRID is activated, it will affect placement of lines and shapes on the entire full page document. The GRID can be turned off any time during a drawing by reselecting it from the menu.



**FIGURE 1.54.** *Goodies menu.*



1. Draw a box using the **HOLLOW RECTANGLE**. Using the **STRAIGHT EDGE** draw a diagonal line from corner to corner (Figure 1.57-A).



A

2. Draw a **HOLLOW POLYGON** (B). Using **LASSO**, place the **POLYGON**'s center on the top of a line (C).

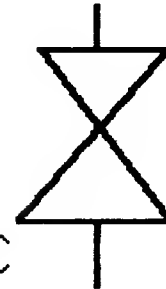


B

3. This last exercise uses **TEXT** icon. After selecting **TEXT**, click the insertion bar on the screen and type the following, changing **STYLE** in the middle of the sentence:

"Cats have green fur."

Click the mouse after the word "have", change the **STYLE**, type in green, click again and continue the text.



C

**FIGURE 1.57.** GRID exercises.

This last exercise is not an easy one. It points out the fact that **TEXT** is not a substitute for word processing. With practice you will begin to see the usefulness of **GRID**.

## **FATBITS**

You may recall that double clicking the **PENCIL** moved your screen into **FATBITS**. **FATBITS** can also be selected from the **GOODIES** menu. Also recall how you edited **PATTERNS** (page 31). **PATTERN** editing is a form of **FATBITS**. If you were going to look at a portion of your drawing screen through a microscope, the drawing would appear as a series of square dots. This is the way drawings look in **FATBITS** but you don't need the microscope.

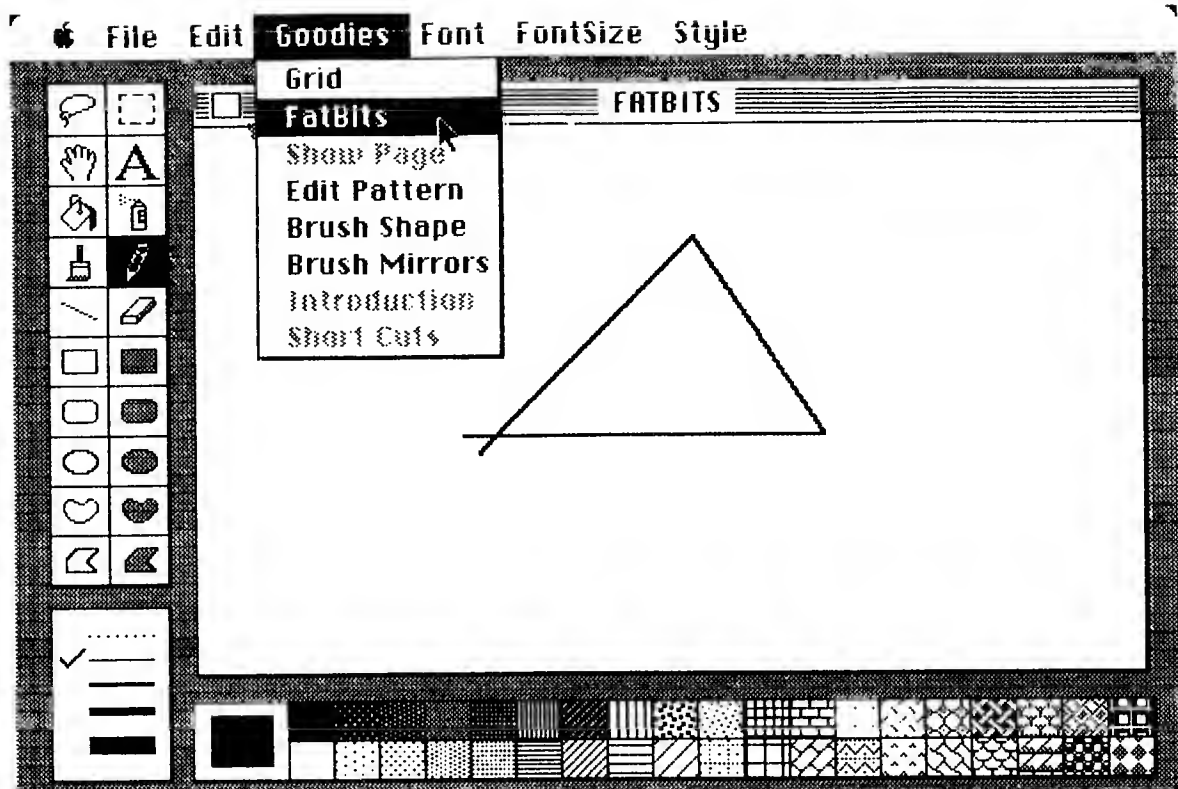


FIGURE 1.58.

Using FATBITS, drawing details which are too fine to alter with usual MacPaint icons on the normal screen can be altered dot by dot (recall the need to remove a dot before using LASSO to overlap transparent images, page 47). Generally, you will use PENCIL to click dots in and out of the drawing. However, you are not limited to the PENCIL since all other icons perform their usual functions in FATBITS.

Any of the following methods will take you into FATBITS:

1. Select FATBITS from the GOODIES menu.
2. Double click the PENCIL icon (A); or,
3. Press the COMMAND key and click while the PENCIL is on the drawing screen (B).

To focus FATBITS on a specific part of the drawing, there are at least three methods you can use.

1. Just before selecting FATBITS, place the PENCIL dot in the area needing the detailed work; or,
2. Place the PENCIL over the area you want magnified. Press the COMMAND key, then click the mouse. Use the same method to exit FATBITS; or,
3. SCROLL while in FATBITS by pressing the OPTION key when the PENCIL icon is on the screen (C). When PENCIL changes to the SCROLL icon, just drag around FATBITS to the area needing work. Releasing the OPTION key returns the PENCIL.

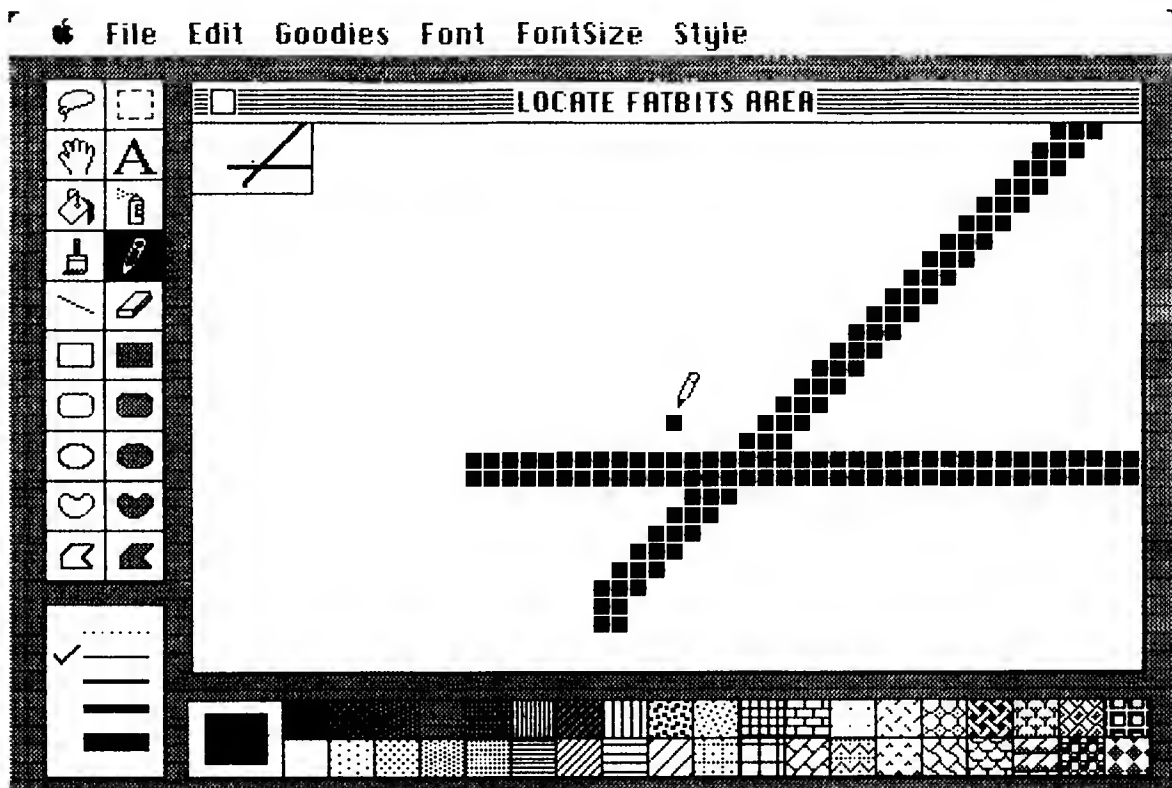


FIGURE 1.59.

To remove dots click the PENCIL over them. To add dots point to a white spot where you want to add them and click.

The rectangle below the close box reflects the changes as they will appear on the normal drawing screen. When you are finished making changes, you can click inside this box to return to the normal screen.

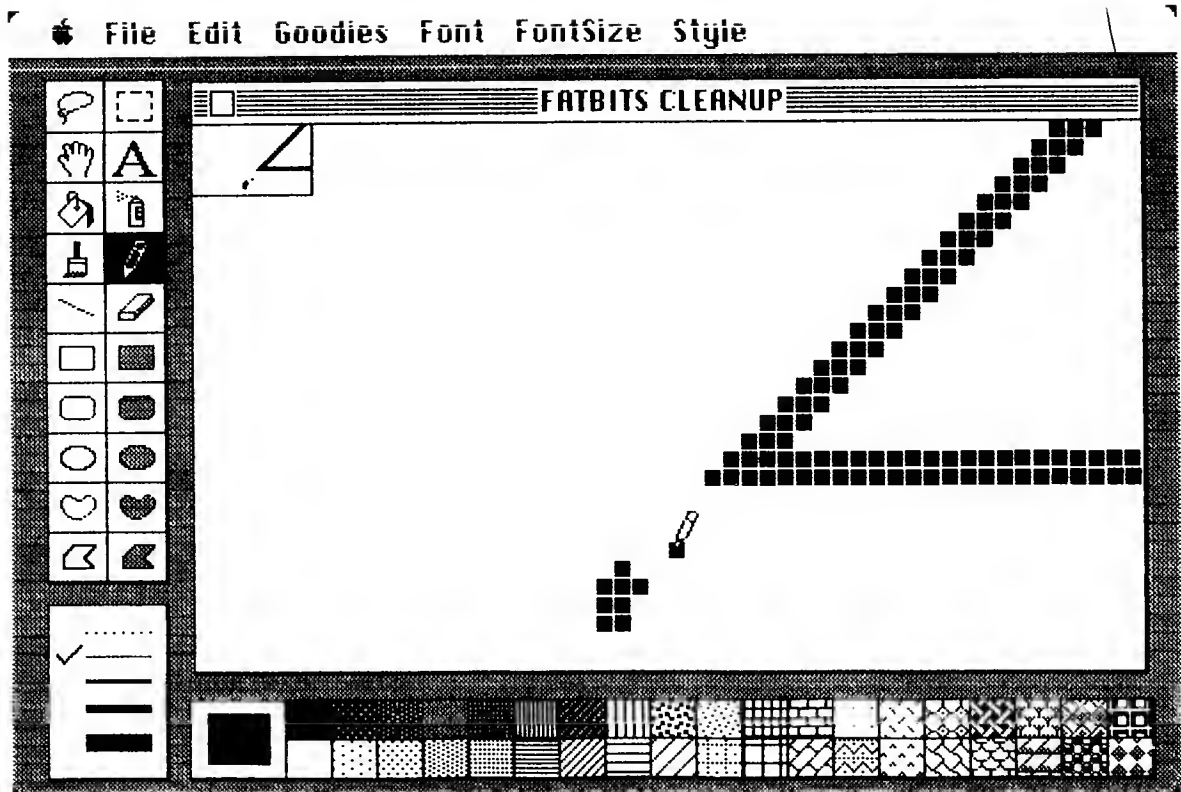
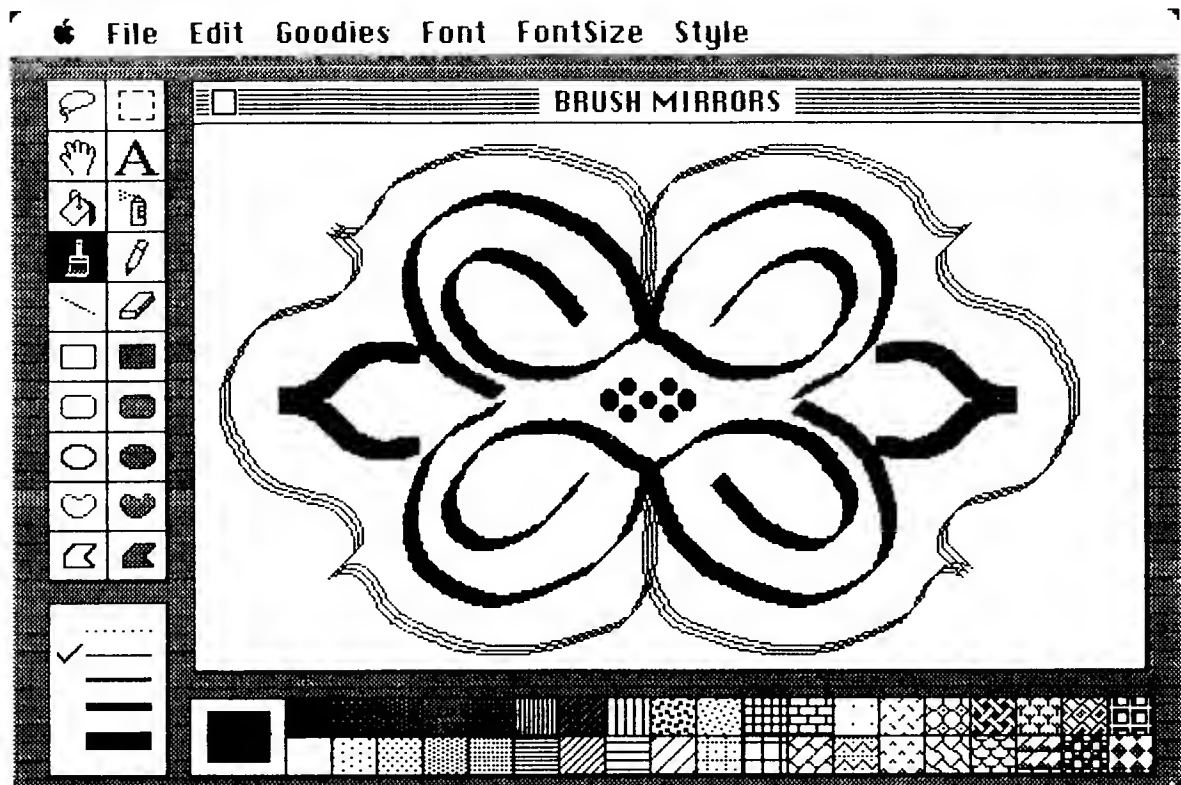
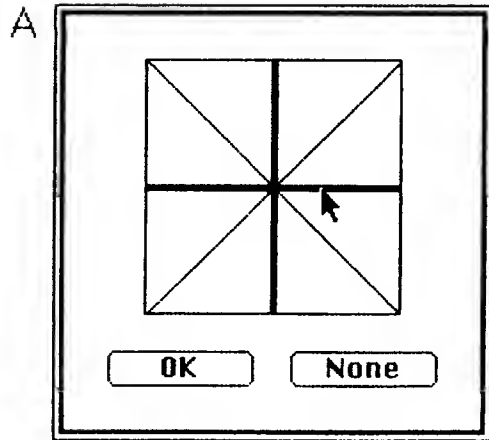


FIGURE 1.60.

Although PENCIL is generally used to remove dots, the ERASER and other icons can also be used. Click in the upper left hand rectangle below the close box to leave FATBITS.





**FIGURE 1.61.**

## **BRUSH MIRRORS**

**BRUSH MIRRORS** gives **PAINTBRUSH** a bit of fun and fantasy. This feature allows you to have two, four, six or even eight **PAINTBRUSHES** on the screen at one time. The screen becomes divided and anything painted in one section will be mirrored in another.

Select **BRUSH MIRRORS** in the usual manner by dragging through **GOODIES** menu until **BRUSH MIRRORS** is highlighted. Figure 1.61-A lets you select how the screen is to be divided. Click the lines on or off with the arrow. Select **OK** when you are ready for some fun. Selecting **NONE** returns the normal undivided drawing screen.

**PAINTBRUSH** is the only icon which takes advantage of **BRUSH MIRRORS**. Experiment with different **BRUSH SHAPES** while using **BRUSH MIRRORS**. All features which normally work with **PAINTBRUSH**, such as **SHIFT** key and **PATTERNS**, also work when **BRUSH MIRRORS** is activated.

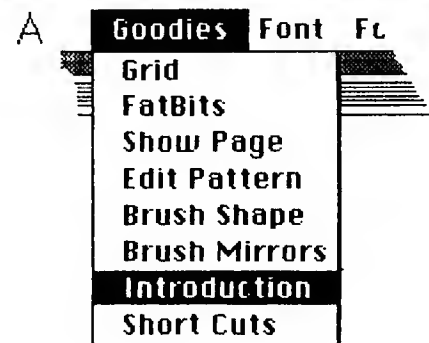
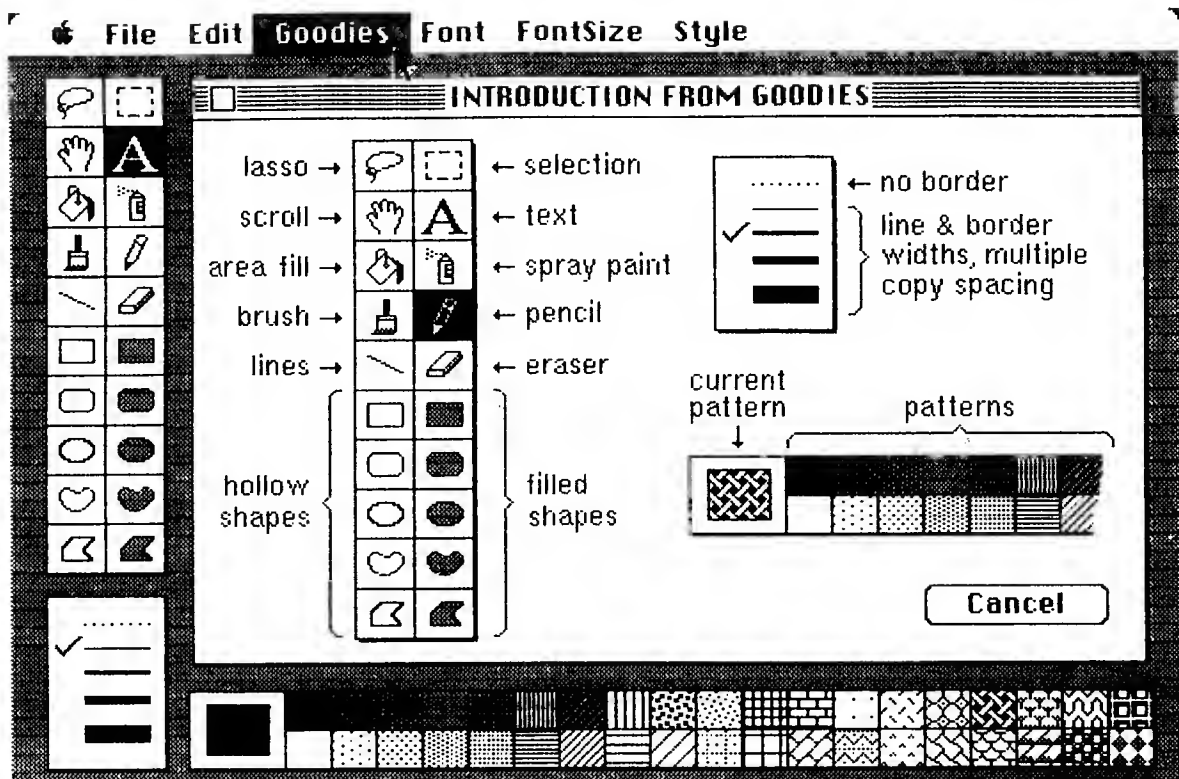
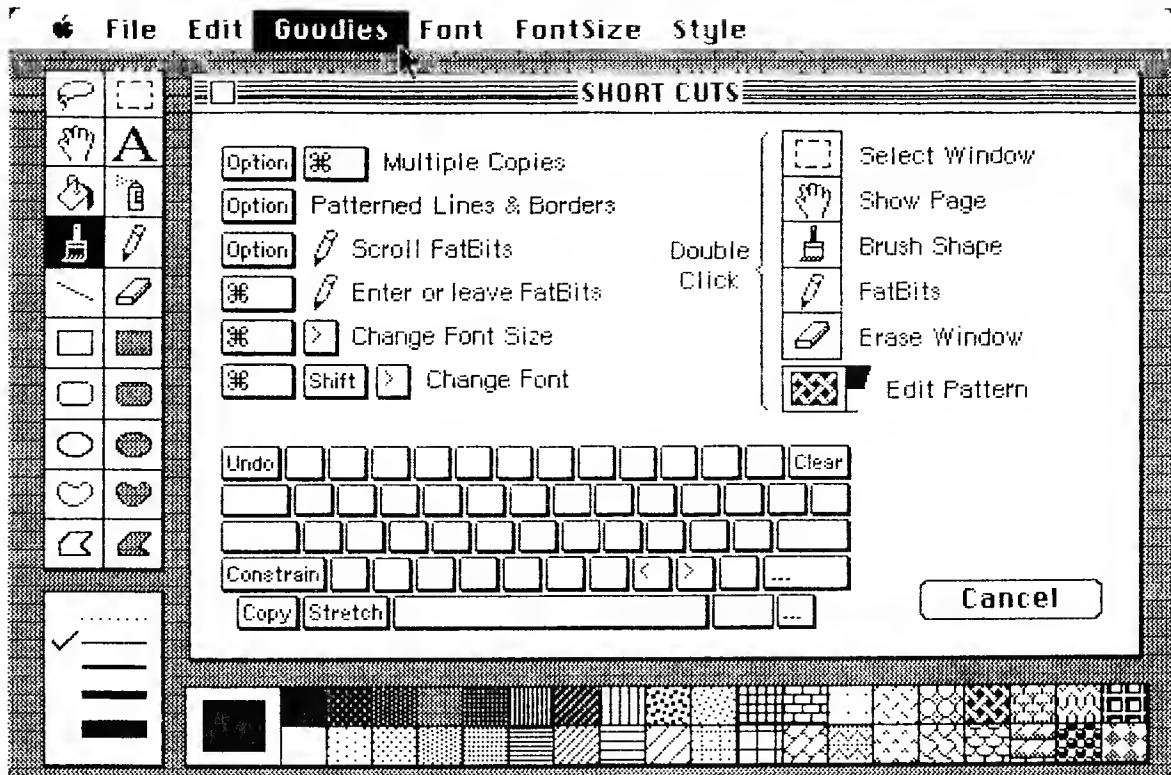


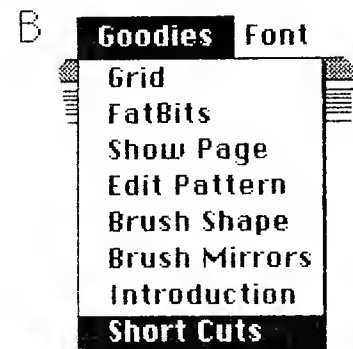
FIGURE 1.62.

Selecting INTRODUCTION or SHORT CUTS from the GOODIES menu at any time will briefly remind you of many MacPaint functions. The drawing you are working on is not disturbed by using these features. CANCEL returns you to the normal drawing screen.



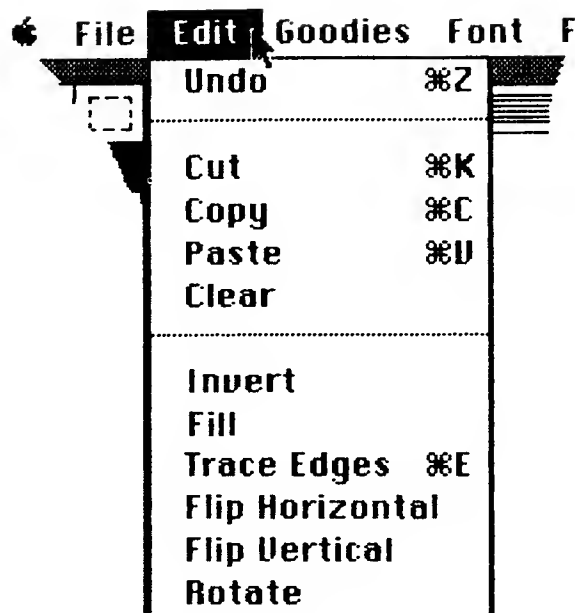


A 



**FIGURE 1.63.** Notice another way to UNDO is to press the tilde/tilde key on the keyboard.

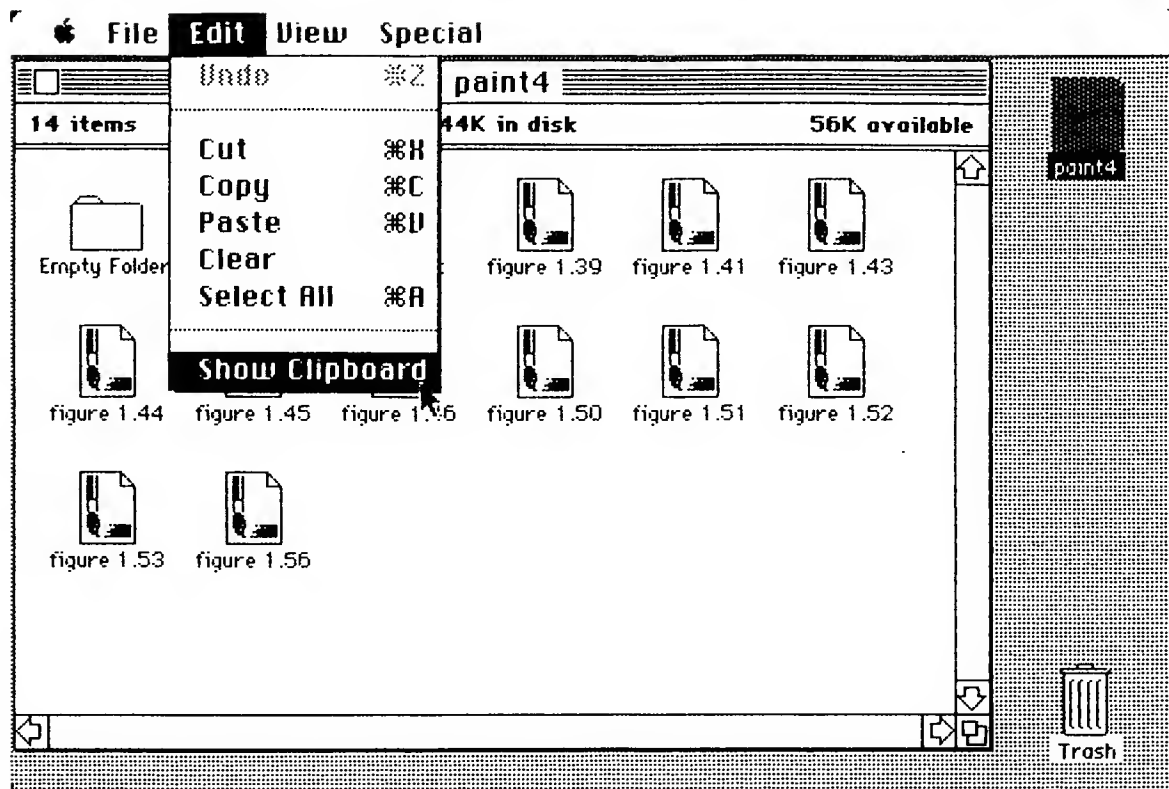
## CLIPBOARD



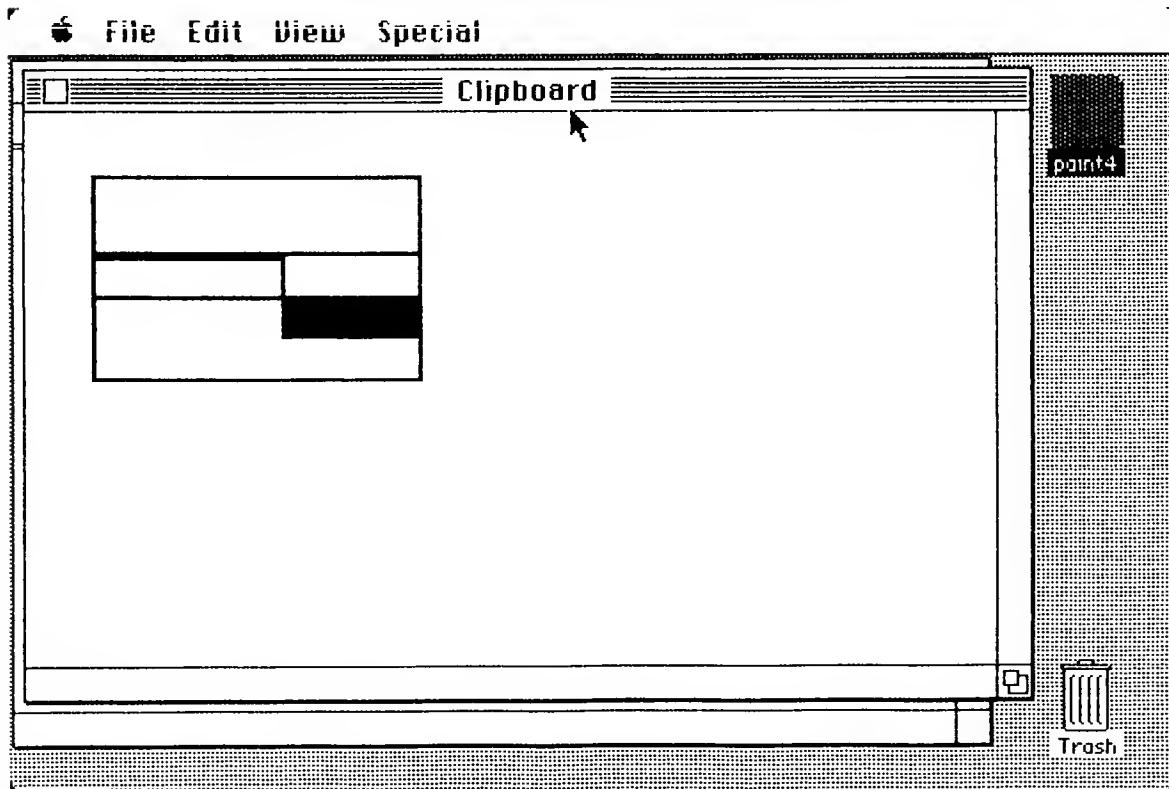
**FIGURE 1.64.** *EDIT menu in MacPaint.*

Before discussing specific features in the EDIT menu, you need to be aware of the CLIPBOARD. The CLIPBOARD is a holding place for any drawing that is CUT, COPIED, or PASTED. The CLIPBOARD has one sheet of paper on it with enough room to store one window's worth of information or one screen image. Each time you CUT or COPY an image, the image goes to the CLIPBOARD replacing whatever it held previously. Whenever an image is PASTED into your drawing, the image must come from the CLIPBOARD. You cannot CUT, COPY, or PASTE without CLIPBOARD.

MacPaint does not show you the CLIPBOARD. If you want to see what is on the CLIPBOARD, you must leave MacPaint by first clicking the close box then dragging through the FILE menu to QUIT. You will be returned to the Macintosh desktop introduced earlier in the chapter (page 7). The EDIT menu from the Macintosh desktop has a feature called SHOW CLIPBOARD. Although this is the only place you can view the CLIPBOARD'S contents, CLIPBOARD is with you throughout MacPaint. Figure 1.65 shows you the EDIT menu from the Macintosh desktop while Figure 1.66 shows contents held on the CLIPBOARD.



**FIGURE 1.65.** *SHOW CLIPBOARD* appears on the *EDIT* menu from the Macintosh desktop when you are not in MacPaint.



**FIGURE 1.66.** Contents of the *CLIPBOARD* viewed from the Macintosh desktop.

## CUT, COPY and PASTE Procedures

You have already seen how to duplicate parts of a drawing using LASSO or the MARQUEE. To move a figure to another part of the same drawing or to another drawing document requires features from the EDIT menu. These features, CUT, COPY, and PASTE allow you to transfer drawings easily from one window screen to another. Going through the actual steps the first time may seem complex, but after a time or two you will be CUTTING and PASTING with little effort.

For example, create a simple logo at the top of a drawing document. You've decided to repeat the logo at the bottom of the document. Since proportions and size must be consistent, the best way to reproduce the logo is to use COPY and PASTE from the EDIT menu.

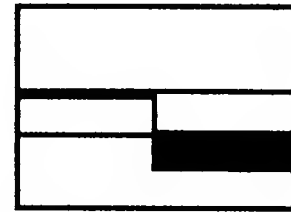
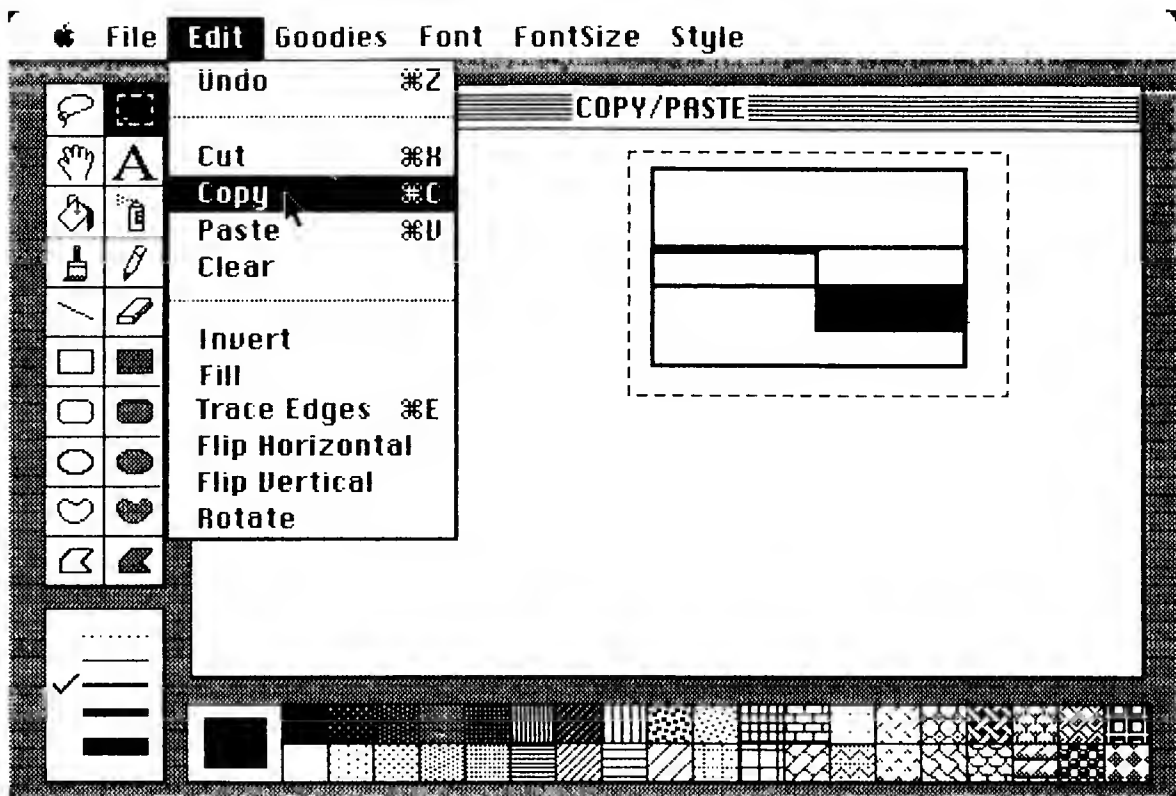
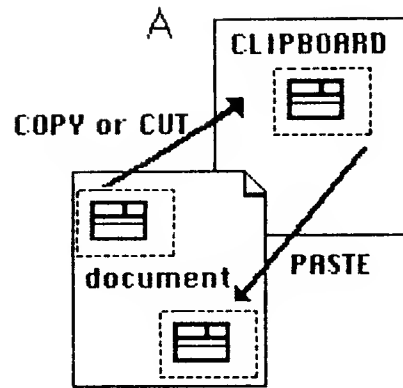


FIGURE 1.67. Sample logo.





**FIGURE 1.68.**

The first step in getting the logo copied to the bottom of the document is to first transfer the logo to the CLIPBOARD. You can use either MARQUEE or LASSO to select the logo. If you are not yet comfortable with MARQUEE and LASSO, you may want to review them at this point (pages 43-51).

1. **Select MARQUEE or LASSO.**
2. **Drag MARQUEE or LASSO around logo.**
3. **Select COPY by dragging through the EDIT menu until COPY is highlighted.**

Logo now automatically goes to the CLIPBOARD. The next step is to move the drawing window to the bottom of the document.

4. **Double click the SCROLL icon and drag the window box to the bottom of the page for a new logo location.**

Next, you will bring the logo from the CLIPBOARD to its new location.

5. **Select PASTE from the EDIT menu by dragging and highlighting.**

Like magic, the logo will appear in the middle of the screen. All PASTE procedures occur in the middle of the screen unless an empty MARQUEE is placed in the new location before PASTING. Then the image from the CLIPBOARD will go into the MARQUEE.

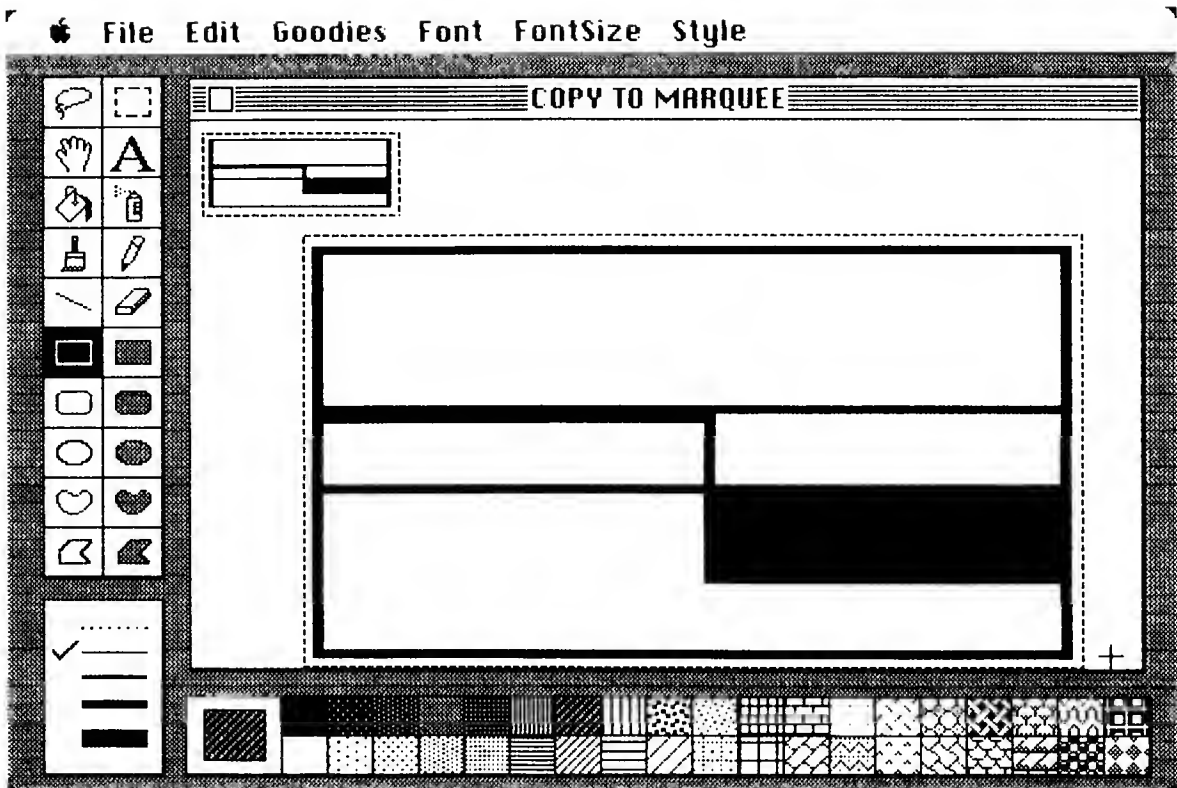



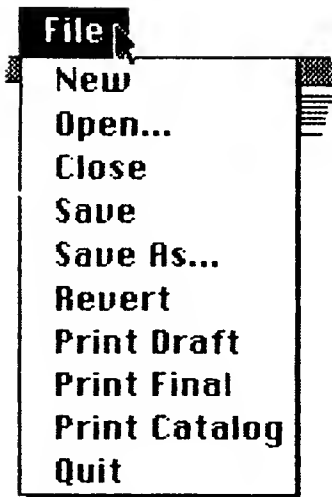
FIGURE 1.69.

ERASE your logo (or select UNDO, or press the BACKSPACE key while MARQUEE is still blinking) and try the procedure again. This time, place a small, empty MARQUEE in one corner of the drawing screen before PASTING. Try again, but let the empty MARQUEE fill the screen. As you can see in this exaggerated exercise (Figure 1.69), when using MARQUEE to reposition the image, the second MARQUEE must be exactly the same size as the first MARQUEE when you selected a drawing for COPY. Otherwise, the image will be distorted, either larger or smaller, wider or narrower, longer or shorter. I prefer to let the image fall on the screen's center since it arrives there as an exact COPY of the original.

---

 The same image remains on the CLIPBOARD until the next time you select COPY or CUT from the EDIT menu—even after you have shut off the Macintosh!

---

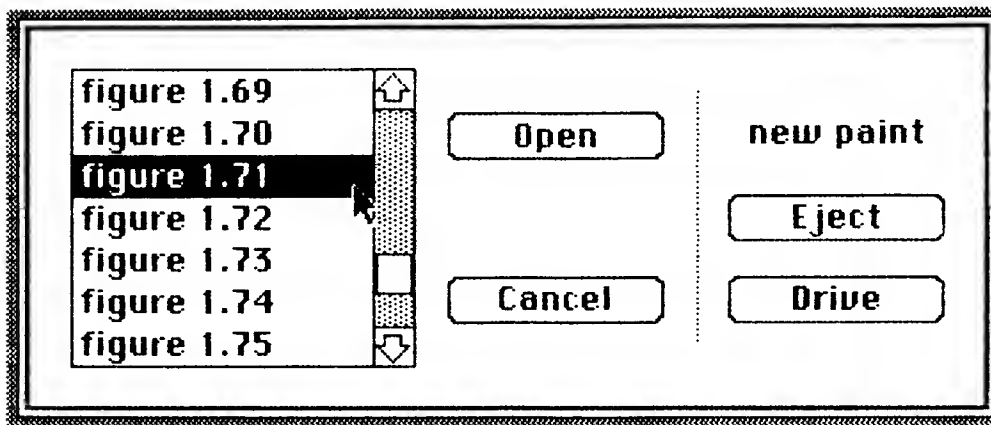


*FIGURE 1.70. FILE menu.*

Before learning to COPY or CUT and PASTE between documents rather than on the same page, we need to digress for a moment to the FILE menu. Since you can be working on only one drawing document at a time, you will be using the FILE menu to OPEN and CLOSE documents. You will also use FILE menu to SAVE and PRINT documents. Let's quickly discuss each FILE feature.

**NEW** gets out a fresh, clean drawing document. The title bar reads "UNTITLED".

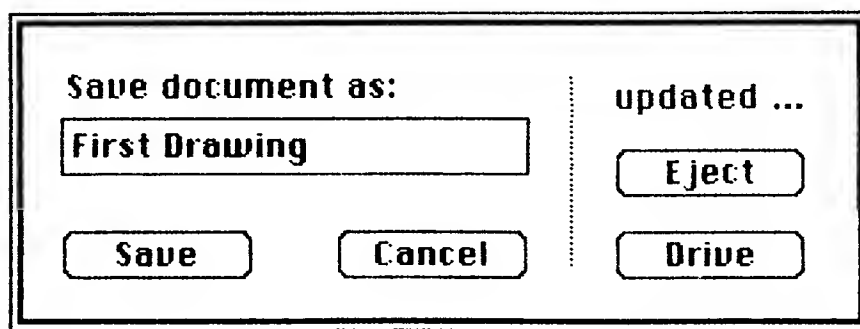
**OPEN** lists the drawings currently saved on the diskette. This is one way to return to an unfinished drawing. You will also OPEN a drawing document when you want to COPY something from it. Once the documents are listed, click to highlight a particular document, then select OPEN in the dialogue box. See Figure 1.71.



*FIGURE 1.71. Dialogue box listing documents on "new paint" diskette.*


**CLOSE** is equivalent to clicking the close box in the menu bar. Selecting **CLOSE** from the **FILE** menu or clicking the close box puts your drawing document away, leaving you with a grey screen.

**SAVE** is usually selected before **CLOSE**. If you don't select **SAVE** before **CLOSE**, MacPaint will ask you if you want to **SAVE** your drawing before **CLOSING** the document. "Yes" will save the document with its most recent changes. If the untitled document had not been previously saved you will need to type in a name as indicated by the blinking bar in the dialogue box. Enter characters from the keyboard and click "Save". "No" will not take your current version to the diskette but the diskette will hold the most recent version **SAVED**. **CANCEL** returns you to the normal drawing screen without taking any action. See Figure 1.72.



**FIGURE 1.72.** Dialogue box requesting the name of the document you want to **SAVE**.

---

 Drawings should be **SAVED** every fifteen minutes. If you have a loss of electrical power or a slip of the mouse, no more than fifteen minutes of work is lost. The habit of **SAVING** frequently cannot be overemphasized.

---

**SAVE AS** will save your drawing under a new name. This will not affect the document as it was under its previous name. You can have two identical documents saved under two or more document names. Most likely, you would be saving two versions of a drawing under two document names. Names of documents can be 64 characters long; however, long names do not fit on the Macintosh desktop conveniently.

**REVERT** replaces your current drawing with the drawing that was most recently saved. If you have **SAVED** frequently, **REVERT** is very useful when you have made a mess of a drawing that looked fine ten minutes earlier.



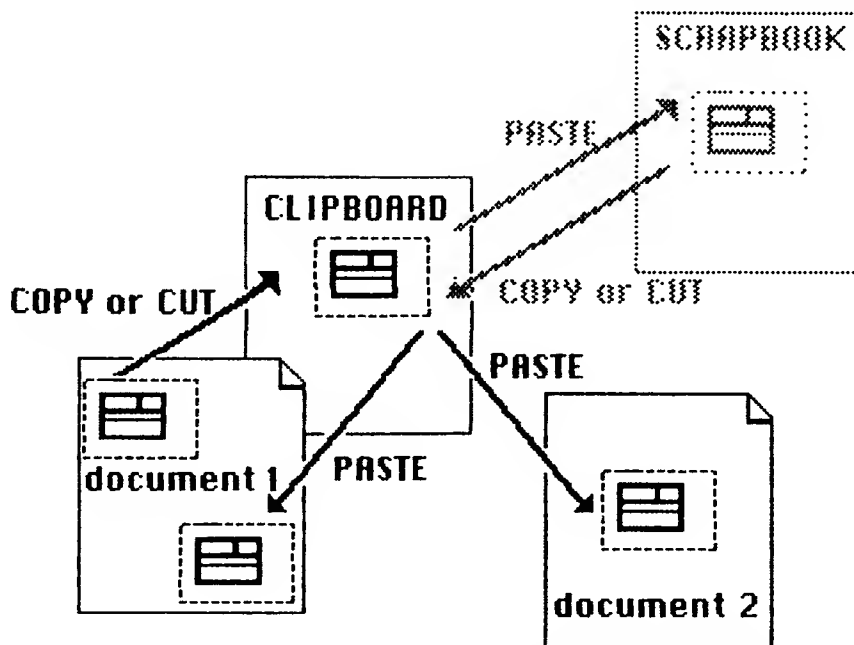
**PRINT DRAFT, PRINT FINAL, and PRINT CATALOG** print your drawing document and catalog on the Imagewriter printer. The Imagewriter and printing techniques are discussed in Chapter 5—Printer, Paper, and Color.

**QUIT** leaves MacPaint and takes you to the Macintosh desktop.

You now know how to save and retrieve your drawings. Before learning how to CUT, COPY, and PASTE between drawing documents, you may need to create something from which you can cut and paste. If you still have a logo, SAVE it by dragging through the FILE menu and highlighting SAVE. Otherwise, take time now to create something fun and easy.

After selecting SAVE, enter the name of your document when the dialogue box prompts you, perhaps “First Drawing” would be an appropriate name. CLOSE “First Drawing” either from the close box or the FILE menu. Now begin a second drawing by selecting NEW from the FILE menu. By now, you should be well acquainted with the FILE menu, so we will return to cutting and pasting procedures between two documents.

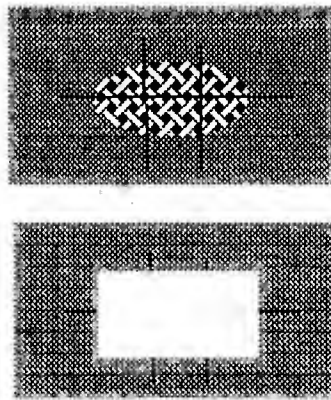
In the following steps, you will be COPYING a portion of the “First Drawing” document and PASTING it into the “Second Drawing” document.



**FIGURE 1.73.** CUT or COPY from one document to another document must always go through the CLIPBOARD first.

1. **SAVE** the new drawing document as “Second Drawing”.
2. **CLOSE** the “Second Drawing” although you don’t have anything on it.
3. **OPEN** the document where sketch is located, “First Drawing”.
4. Using **MARQUEE** or **LASSO** as selectors around the sketch, **COPY** the sketch by dragging through the **EDIT** menu and highlighting **COPY**. Sketch now goes to **CLIPBOARD**.
5. **CLOSE** the document “First Drawing”.
6. **OPEN** the “Second Drawing” through **FILE** menu.
7. **Select PASTE from the EDIT menu**. Your sketch is now on “First Drawing”, “Second Drawing”, and the **CLIPBOARD**.

After selecting **PASTE** and while the **MARQUEE** or **LASSO** is still blinking, you can move the pointer over the selected image and apply any **MARQUEE** and **LASSO** feature previously discussed.



**FIGURE 1.74. CUT with MARQUEE.**

**CUT** in the **EDIT** menu performs the same function as **COPY** with one difference. **CUT** removes the image from the original document. Figure 1.74 shows what’s left after the **OVAL** was **CUT** with the **MARQUEE**.

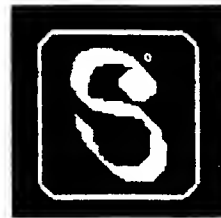
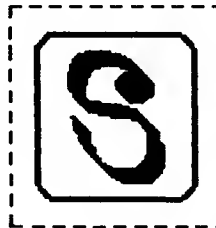
**UNDO** is especially useful in **CUTTING/COPYING** and **PASTING** operations of nearly completed or complex drawings. Sometimes your **PASTED** image turns out to be larger than you had planned for the available space. Even after moving the image around the screen it may cover text or other images. **UNDO** and decide how to reorganize the drawing. This is a good opportunity to drag a blank **MARQUEE** into the available space you’d like the image to fit. Using the **SHIFT** key with the **MARQUEE** will keep the image in proper proportion.

The remaining **EDIT** features are fun to try as well as being very useful. Each of the features listed here requires that you drag the **MARQUEE** around the image. Then select the desired feature from the **EDIT** menu.



**LASSO** cannot be substituted for the **MARQUEE** in the following **EDIT** features: **TRACE EDGES**, **FLIP HORIZONTAL**, **FLIP VERTICAL**, and **ROTATE**.

### **Invert**

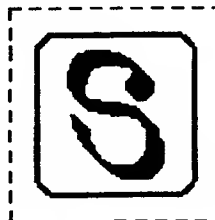


### **Trace Edges**



### **Flip Horizontal**

Turns image  
over laterally



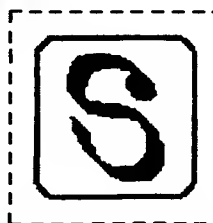
### **Flip Vertical**

Turns image  
upside down  
and backwards



### **Rotate**

Rotates 90° at  
a time counter  
clock wise



*FIGURE 1.75. More EDIT features.*

FILL utilizes any PATTERN from the PATTERN palette. After dragging either the LASSO or the MARQUEE around a drawing, the image is FILLED with PATTERN in the PATTERN indicator.

CLEAR erases anything within the LASSO, the MARQUEE, or a page in the SCRAPBOOK (SCRAPBOOK is discussed next).

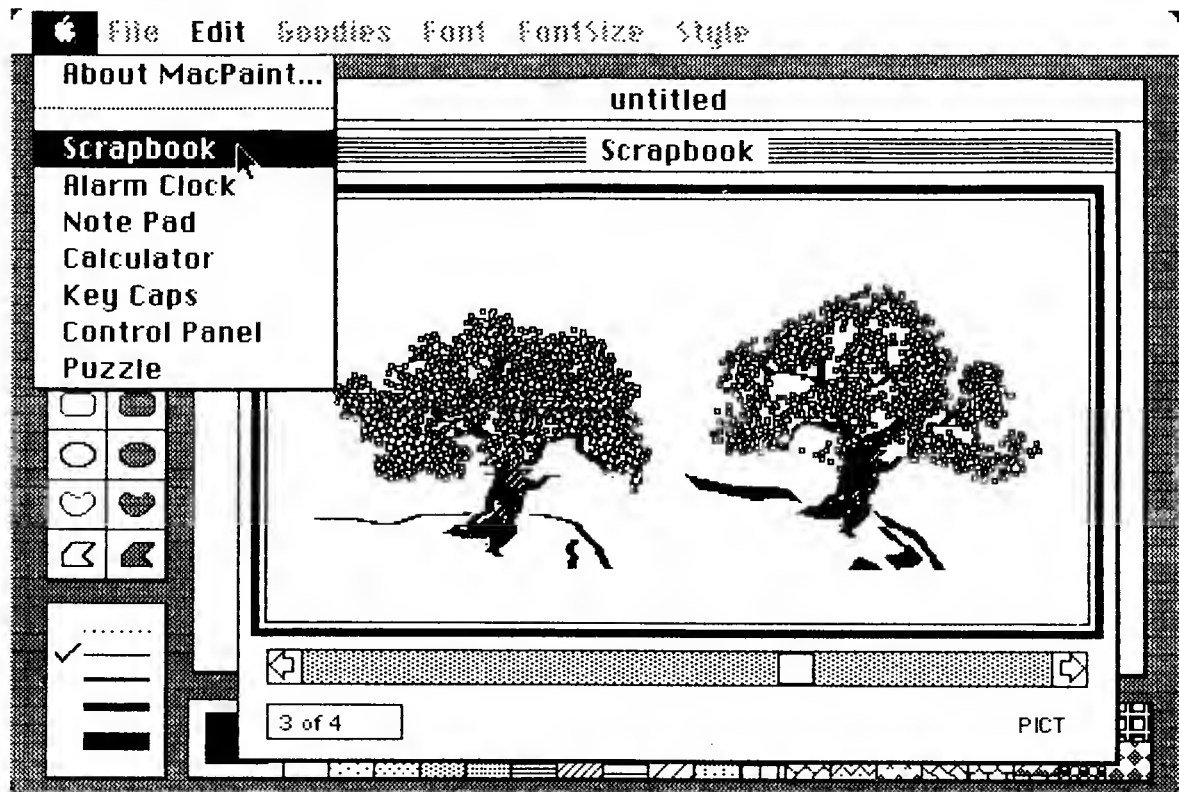


FIGURE 1.76.

The SCRAPBOOK is a place to store frequently used drawings. Like the PATTERN menu or the CLIPBOARD, the SCRAPBOOK is always available without CLOSING or disturbing the document on which you are currently working.

Adding drawings to SCRAPBOOK utilizes CUT, COPY and PASTE techniques and, therefore, uses the CLIPBOARD. To add a drawing to the SCRAPBOOK:

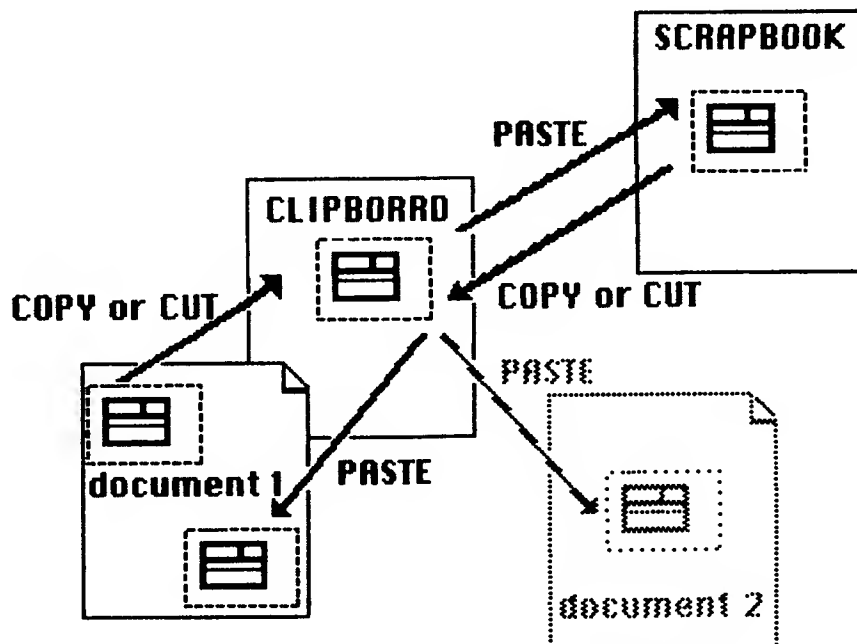
1. **CUT or COPY drawing from the document currently open.** The drawing goes to CLIPBOARD.
2. **Open the SCRAPBOOK by dragging the mouse through the Apple menu and highlighting SCRAPBOOK.**
3. **Turn the SCRAPBOOK pages by clicking the arrows below the SCRAPBOOK image.** The right hand arrow turns pages forward



in the SCRAPBOOK while the left hand arrow turns pages backward.

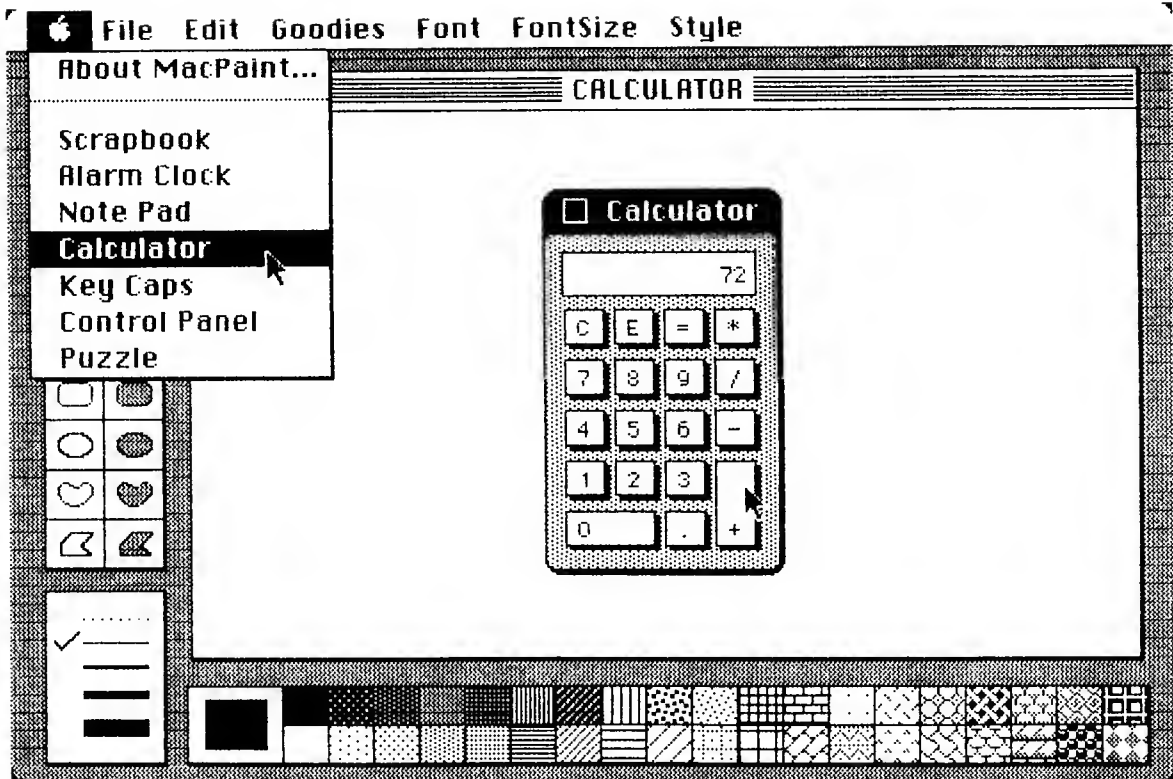
4. To insert the drawing into the SCRAPBOOK, open the SCRAPBOOK to the page number where the new image will be placed. If page 3 is the intended location, the tree drawings are moved to the following SCRAPBOOK pages. The trees, which were on page 3 will be moved to page 4. All succeeding drawings are moved to the following page.
5. Select PASTE from the EDIT Menu and the drawing is placed into the SCRAPBOOK.

To delete a drawing from the SCRAPBOOK, simply open the SCRAPBOOK to the image to be deleted and use CUT or CLEAR from the EDIT menu. All drawings that follow are then moved up one page so that no blank pages remain in the SCRAPBOOK. CLOSE the SCRAPBOOK either with its CLOSE box in its title bar or from the FILE menu.



**FIGURE 1.77.** To CUT, COPY, or PASTE to or from the SCRAPBOOK, all drawings must pass through the CLIPBOARD.

To transfer a drawing from the SCRAPBOOK to your document, open SCRAPBOOK. Using COPY from the EDIT menu, COPY the image to the CLIPBOARD. CLOSE the SCRAPBOOK. Place the image onto your document using PASTE from the EDIT menu. This transfers the image from the CLIPBOARD into your document.



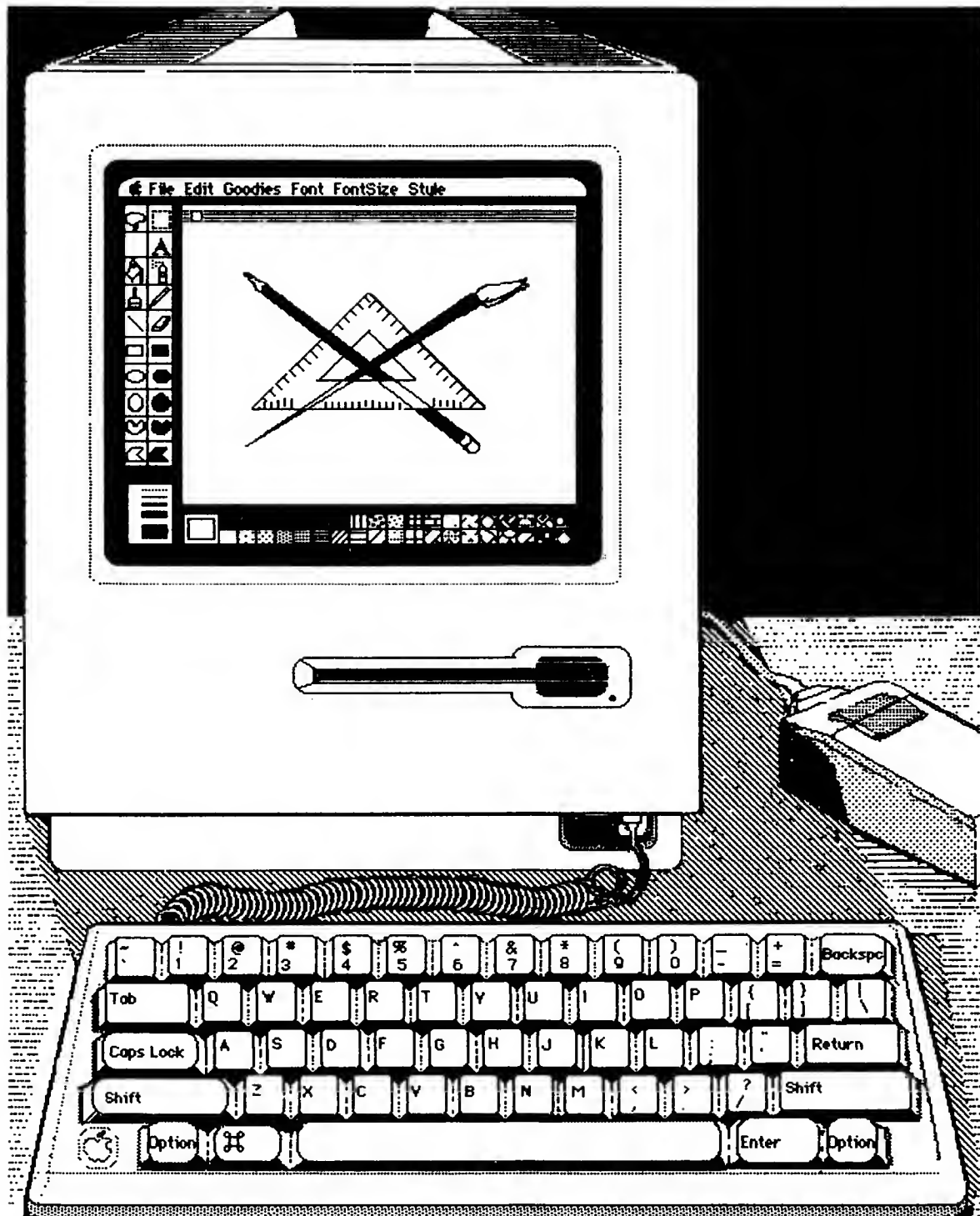
*Figure 1.78.*

The CALCULATOR can be called upon to perform basic arithmetic while using MacPaint. This is especially useful in calculating scale or other engineering measurements.

You can either click the CALCULATOR buttons with the mouse or use the keyboard to enter numbers and arithmetic functions. Try CUT, COPY, or PASTE after using the CALCULATOR. You can PASTE CALCULATOR results into the SCRAPBOOK, documents, or the NOTEPAD. Later, the results can be PASTED back onto the CALCULATOR and included in a new computation.

You now have a basic knowledge of MacPaint's tools. Chapter 2 is going to help you learn to use this knowledge creatively before beginning drawings in Chapter 3.

## Chapter 2 Getting Around in MacPaint



Now that you have been introduced to MacPaint's tools, you will need to learn how to use them efficiently to produce useful and meaningful drawings. Controlled drawings depend on control of MacPaint's tools. Controlled drawings are something other than random lines, shapes, and patterns on the screen. Controlled drawing is precisely positioning lines and shapes where they are needed; to bisect an angle, or find the center of a circle. This chapter shows you how to get going with some of these ideas. Beginning with pointer control and concluding with page format, scale, and problem areas for new MacPaint users, you will begin to appreciate what MacPaint can and cannot do for you.

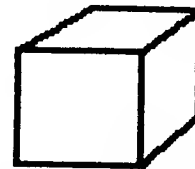
## ***Mouse and Pointer Control***

As you begin working more rapidly with the mouse, you can develop sloppy habits that lead to erratic results on the screen. When you click the mouse button, do it without moving the mouse. When you drag the mouse controller across the table, release the mouse button when you have stopped moving the mouse. Clear, distinct "clicks" and "drags" send clear signals to Macintosh. If you are in the habit of clicking without moving the mouse you will have fewer accidents caused by the pointer sliding into the wrong command or menu.

Pointers are very useful guides to controlled graphics when you know what to look for. The cross shaped pointer is especially helpful. When connecting one line to another, parts of the pointer should disappear. The black cross on a black line cancels the black color leaving white. Consequently, to connect two lines smoothly, the cross pointer should be invisible from its center outward over the existing black line.



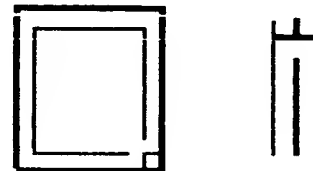
**FIGURE 2.1.** *The cross pointer over lines.*



**FIGURE 2.2.** *Draw a cube for gaining better control of your cross-shaped pointer.*

Try drawing a cube using the STRAIGHT EDGE. This will give you practice in pointer control and reward you with smooth corners without using FATBITS or ERASER.

The pointer's cross-arms can also be used to measure distance when placing one line close to another. An example is drawing a RECTANGLE inside another or a double lined border. Using the cross pointer as a spacer results in consistent spacing between two lines.



**FIGURE 2.3.** *The pointer can be used as a guide for double-lined borders.*

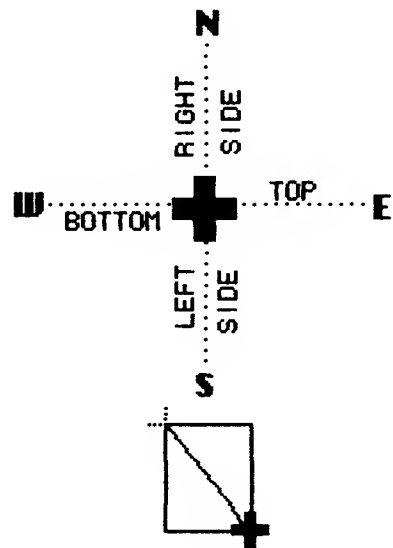


## RECTANGLES and OVALS

Knowing a little more about the cross-shaped pointer will tame the elusive OVAL. The first time you drew a HOLLOW or a FILLED OVAL on the screen, you probably had great fun stretching and shrinking it all over the screen. The first time you wanted to place it precisely in a particular spot, the OVAL went everywhere but where it should have.

Before understanding how the OVAL is placed, you must understand how the RECTANGLE is formed. The RECTANGLE'S development is easier to see than an OVAL'S but both shapes use the same diagonal stroke. You will see that the pointer is used to guide the OVAL'S position in the same manner as the RECTANGLE.

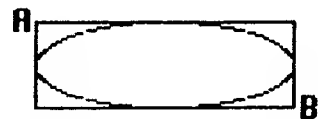
Let's give the pointer extensions to its cross arms and name them north, south, east and west. Draw a RECTANGLE and notice the position of the pointer as you draw the shape. The center of the pointer becomes the corner of the RECTANGLE. Before moving diagonally top to bottom, the pointer's east arm becomes the top of the RECTANGLE while the south arm is the left side. As the pointer drags away from its center, the west arm is the bottom and the north arm becomes the right side (see Figure 2.4.).



**FIGURE 2.4.** The cross-shaped pointer is used as a guide to drawing RECTANGLES.

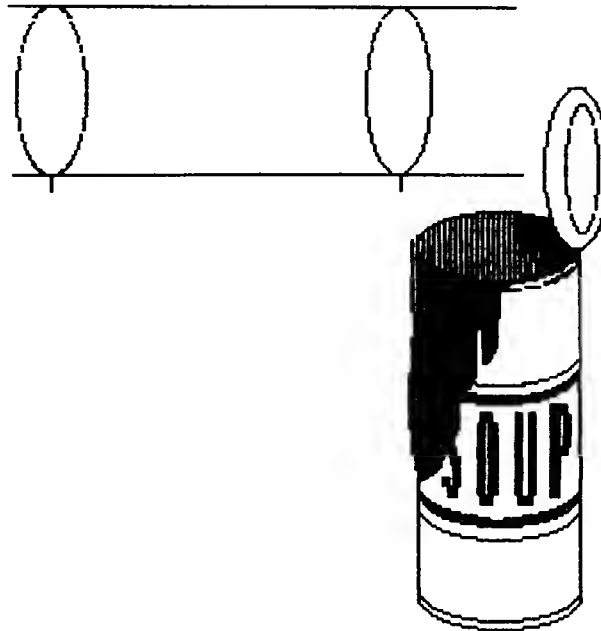
Applying these same principles to the OVAL, you can see how OVALS end up where they do. The OVAL develops like the RECTANGLE but without corners. The following exercises clarify the point.

Draw a RECTANGLE, then place an OVAL inside it. When drawing the OVAL begin at the corners where you began the RECTANGLE (points A and B in Figure 2.5). Now reverse the procedure. Draw the OVAL first and place the RECTANGLE around it so that it looks similar to Figure 2.5. The centers of each side of the RECTANGLE should be tangent to the OVAL.



**FIGURE 2.5.** Draw an OVAL inside a RECTANGLE.

Here is another exercise. Draw two parallel lines and fit the OVALS in between. Here lies the beginning of a cylinder. By now you should be getting the feel and control of OVALS.

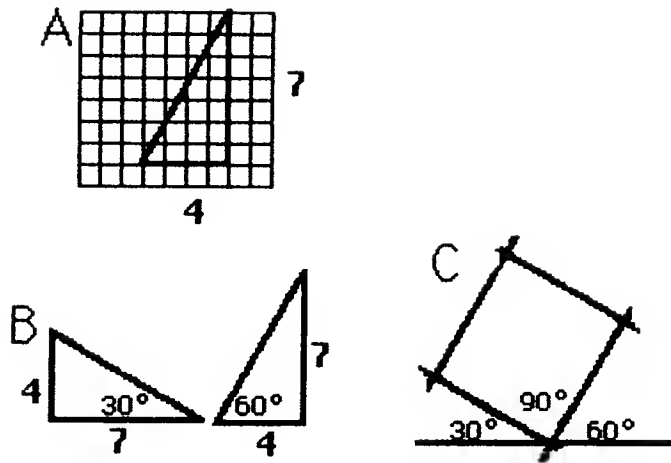


**FIGURE 2.6.** *Cylinders.*

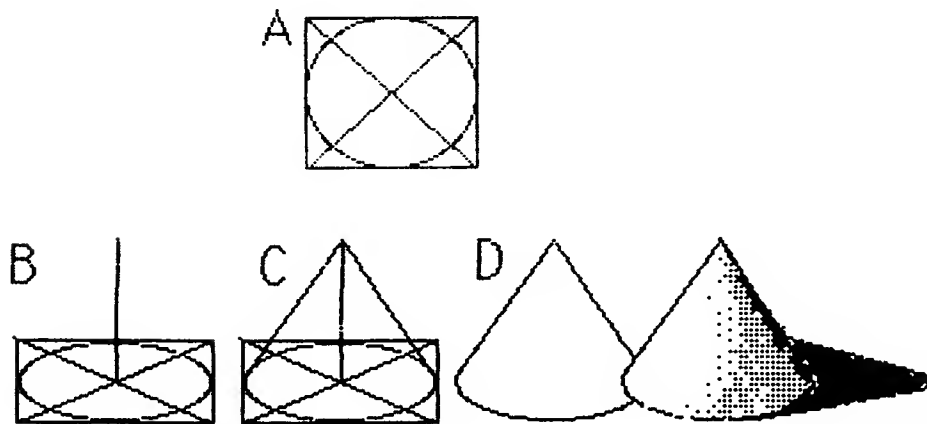
## ***Geometry***

A few exercises in geometry will provide angles and forms you may find useful in future drawings. The exercises also provide good practice for pointer control.

Architects and engineers frequently need to lay out technical drawings on a  $30^\circ$  or  $60^\circ$  angle. As a rule of thumb, our cone of vision (what we see in one view) is about  $60^\circ$ . One-sixth of a pie is  $60^\circ$  and one-twelfth of a pie is  $30^\circ$ . There are many instances when a  $30^\circ$  or  $60^\circ$  angle is needed. MacPaint provides a  $45^\circ$  angle with the SHIFT key and the STRAIGHT EDGE. Beyond the  $45^\circ$  angle, however, we are on our own. Using triangles on a grid background create  $30^\circ$  and  $60^\circ$  angles; the ratio of triangle sides is 4:7 or 7:4 (Figure 2.7). Use a grid FILLED RECTANGLE and draw the triangle inside the RECTANGLE counting 4 squares on one side and 7 on the other (Figure 2.7 A). Carefully erase the grid to expose the angles more clearly (Figure 2.7 B-C). By ROTATING or FLIPPING the angles, you can quickly set up a box that is oriented  $30^\circ$  or  $60^\circ$  to the bottom of the screen.

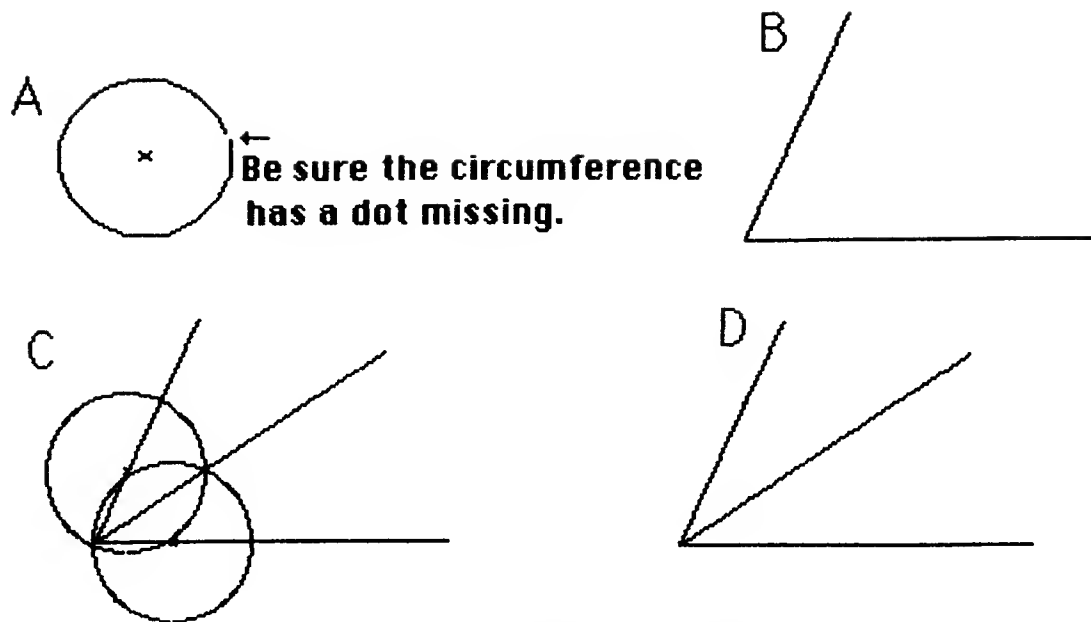


**FIGURE 2.7.** *Creating 30 and 60 degree angles.*



**FIGURE 2.8** *You can create cone shapes by first finding the center of an OVAL.*

The center of a circle is needed for many types of drawings: wheels, cones, nuts and bolts. Find the center of a circle by placing a box around a circle so that it is tangent to the circle on four sides as shown in Figure 2.8 A. Draw diagonal lines from corner to corner. The circle's center is at the point where the lines cross. Accuracy is important at each step in this example. Try finding the circle's center with and without the GRID. Using FATBITS and ERASER, clean up the drawing so that only a circle with a small "x" remains. The oval's centers can be found using the same method. The basis of a cone lies in finding the center of an oval (Figure 2.8 B-D).



**FIGURE 2.9.** *Bisecting an angle.*

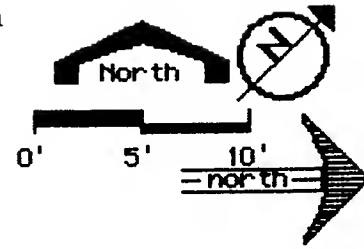
For the next exercise, we will bisect an angle using circles with centers. If you didn't use the SHIFT key and the HOLLOW OVAL icon in the previous exercise, use them now to create a perfect circle. Locate the center of the circle as you did before. Create a small opening in the circumference. Removing one dot is sufficient if the one dot BORDER LINE WIDTH was used (Figure 2.9 A). This creates a transparent circle when LASSOING it over other forms. The circle will now be used to bisect an angle. Draw an angle (Figure 2.9 B). Using LASSO and the OPTION key, make a copy of your circle from the previous exercise. Move two circles over the angle so the circle centers sit on the angle line and the circle's circumference is at the angle's apex (Figure 2.9 C).

If your circles don't overlap make them larger or the angle smaller. Using STRAIGHT EDGE, draw a line from the apex through the point where the circles cross. This divides the angle in half. You may want to carefully ERASE the circles to see the results of your handiwork (Figure 2.9 D).

## **SCRAPBOOK Collections**

Finding the center of a circle and cleaning it up for useful application requires time and a steady hand. These types of frequently used drawings are best kept in the SCRAPBOOK. You may want to keep an assortment of items on one SCRAPBOOK page. As new drawings are developed or found, you will want to add them to existing collections in the SCRAPBOOK. Using north arrows in the next exercise as an example, you will see the most efficient method for maintaining them on one SCRAPBOOK page. Having saved a collection of north arrows, they will be available for use in later drawings. If you prefer something other than north arrows, create a collection of other simple shapes for the exercise.

1. Draw three or four north arrows on one-half of the drawing screen.
2. LASSO and move the arrows into a close arrangement.
3. Now LASSO the entire group of arrows and COPY to the CLIPBOARD.
4. Open the SCRAPBOOK and PASTE.
5. Close the SCRAPBOOK.



**FIGURE 2.10.** North arrow collection.

The purpose in packing the arrows tightly is to economize on space when PASTING them back into a document. Since you can't work in the SCRAPBOOK, you will need to bring the complete contents of one SCRAPBOOK page onto the drawing screen. If there isn't enough room left on the screen for the SCRAPBOOK contents and the existing work, you'll be blocking out parts of your current work. In such a case, the alternative is to select UNDO and juggle between the CLIPBOARD, a clear screen, and the screen where you wanted the SCRAPBOOK image in the first place. Keeping drawings packed tightly on the SCRAPBOOK and using the LASSO rather than the MARQUEE to COPY or CUT will minimize these problems.

Let's add another north arrow to the existing collection to be sure the process of adding to an existing SCRAPBOOK page is clear.

1. Draw a new north arrow.
2. Open the SCRAPBOOK and COPY your north arrow collection to the CLIPBOARD.
3. Close the SCRAPBOOK.
4. PASTE arrows from the CLIPBOARD to the drawing screen.
5. Move the new arrow in with the old arrows.
6. LASSO the entire group of arrows and COPY to the CLIPBOARD.
7. Open the SCRAPBOOK and PASTE from the CLIPBOARD.



**FIGURE 2.11.** A new north arrow to be added to collection of the old north arrows in Figure 2.10.

Now a new north arrow has been added to your collection. You could have each arrow on a different page of the SCRAPBOOK rather than several arrows on one page and an assortment of widgets on another. This would create an unwieldy SCRAPBOOK making it more difficult to locate the necessary drawing, or more likely, take up unnecessary space on the diskette.

A SCRAPBOOK can have any number of pages. You will quickly find that diskettes fill up with only a few drawings. The bigger the SCRAPBOOK, the fewer completed drawings you can store. To make the best use of storage space on a diskette, keep the SCRAPBOOK CLEARED of unused drawings.

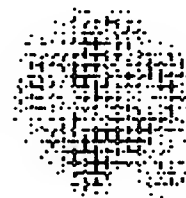
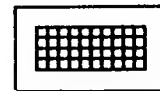
## ***Experimenting with PATTERN***

Having a palette of useful symbols for materials used in manufacturing or construction drawings requires some playful experimentation. These symbols you create might be used to represent concrete, compacted soil, a tweed fabric, roofing texture and many other materials. Using SPRAY PAINT, PATTERNS, INVERT and TRACE EDGES from the EDIT menu you will have an endless supply of symbols.

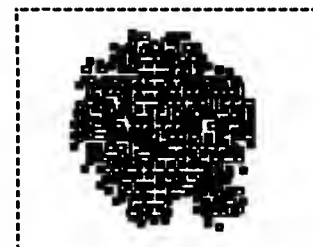
Select a PATTERN and SPRAY PAINT a small section (Figure 2.12). Place the MARQUEE around the patch of PATTERN and select TRACE EDGES from the EDIT menu (Figure 2.13). Try INVERT as well (Figure 2.14 and 2.15).

Another place for experimenting with symbols is in PATTERN edit. Double click a PATTERN. As you make random changes to the pattern, keep your eye on the right hand square that shows the results of the PATTERN change. See page 31 for PATTERN edit.

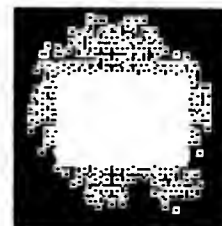
Finally, when you have several symbols you like, CUT and PASTE them into your SCRAPBOOK. The next time you need a sample, get out the symbol collection from your SCRAPBOOK. Using LASSO or MARQUEE, you can stamp the symbol any where you need it (Figure 2.16).



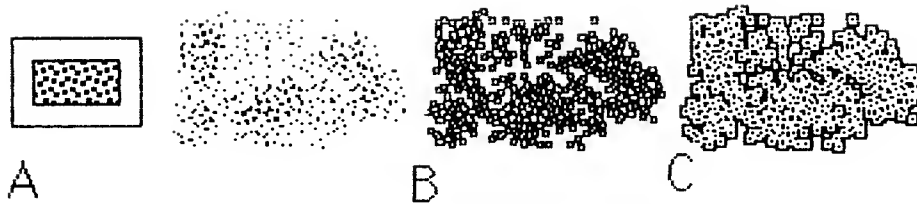
**FIGURE 2.12. PATTERN and SPRAY PAINT.**



**FIGURE 2.13. MARQUEE and TRACE EDGES.**



**FIGURE 2.14. INVERT and CUT sample for SCRAPBOOK.**



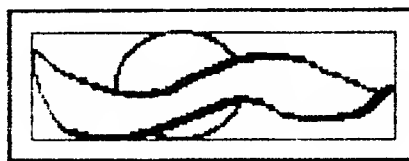
**FIGURE 2.15.** Select **PAT-  
TERN** and **SPRAY PAINT** (A).  
**TRACE EDGES** (B), and **IN-  
VERT TRACED EDGES** (C).



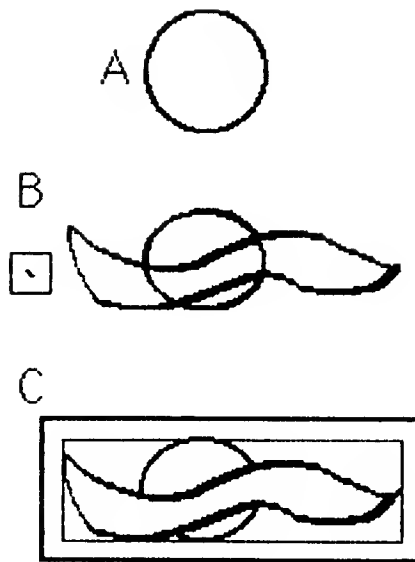
**FIGURE 2.16.** Three trees.

## Layering Drawings

MacPaint has provided a new drawing environment. The approach to building a drawing will sometimes be different from manual methods that use pencil and paper at your desk. Using MacPaint in a manual approach to drawing, you can continue adding lines to an image until the image is complete. Or, you can build a drawing in components and layers. This method is similar to the prefabrication of a building. The components are built in different places, and then brought together to form a complete building. Compare the two strategies in creating the logo.

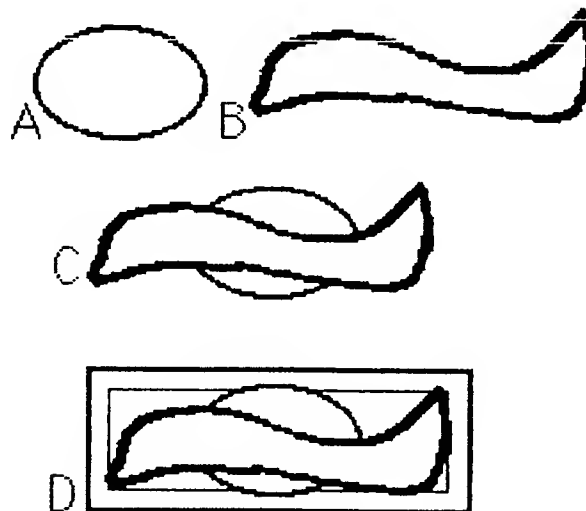


**FIGURE 2.17.** Sample logo.



**FIGURE 2.18.** *Logo drawn in a manner similar to drawing with pencil and paper.*

1. **HOLLOW OVAL** drawn (Figure 2.18 A).
2. **PAINTBRUSH** with slanted **BRUSH SHAPE** selected to create wing (B).
3. **RECTANGLES** added and **FATBITS**, **ERASER**, and **PAINTBRUSH** with white paint used to clean up logo (C).

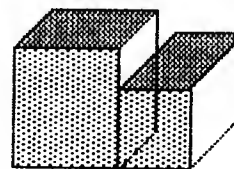


**FIGURE 2.19.** *Logo drawn using a layered approach.*



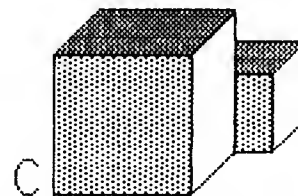
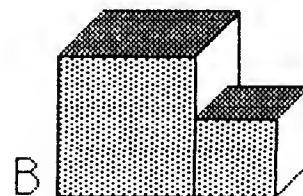
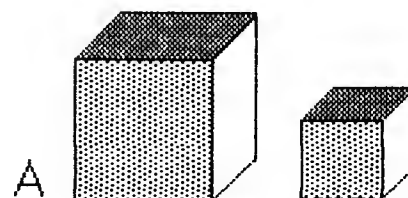
The same logo was created again by drawing each part separately, and LASSOING that part over the previous part (Figure 2.19 A-D). This layered approach eliminates much of the erasing as in Figure 2.18.

In more complex shapes with depth and volume, layering drawings is the easier approach. Furthermore, anytime detailed erasing can be avoided you will save valuable time. Draw two sets of attached cubes, the first set without using LASSO (Figure 2.20). Cubes can be formed with RECTANGLES and STRAIGHT EDGE.



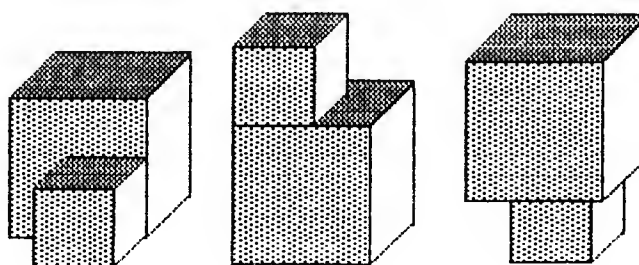
**FIGURE 2.20.** Cubes drawn in a manual fashion without using LASSO.

In the second set of cubes, draw each one separately, then LASSO one cube next to the other (Figure 2.21 A).



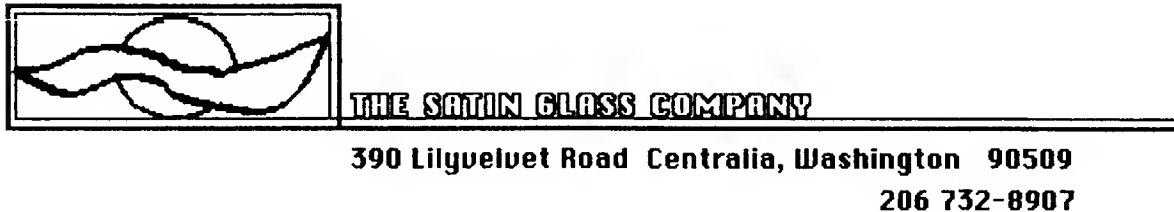
First LASSO the small cube over to the large cube (Figure 2.21 B) then LASSO the large cube to the small cube (Figure 2.21 C).

**FIGURE 2.21.** Two cubes drawn separately then LASSOED together.



**FIGURE 2.22.** Stacked cubes with LASSO.

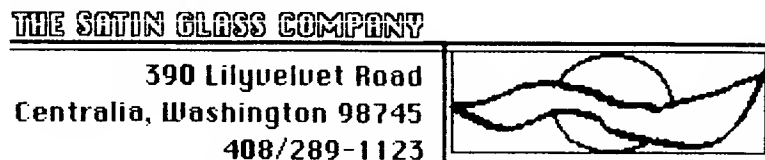
As you see, lines which should not be revealed are hidden when overlaying with LASSO. You can achieve a variety of effects with the same components depending on which cube was LASSOED and pulled over to the other. Many different effects are quickly achieved with the same cubes (Figure 2.22). It is not always possible to layer drawings. As you draw, you will find a combination of the two approaches, manual-like and layering, will give more flexibility and better use of your time.



*FIGURE 2.23. Sample letterhead.*

## ***Vertical and Horizontal Page Format***

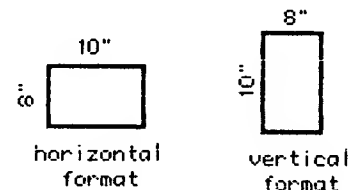
The approach to drawing sometimes will be influenced by a drawing's size and page format. To cover a full 8" x 10" page, the window screen must be SCROLLED at least six different times. To appreciate this fact, let's create a letterhead using the previous logo or create one of your own. Add to the logo a company name, address, and phone number. Starting from the left hand side of the screen you will finish about half of the address if you expect a letterhead to stretch across the top of the page. You will have to SCROLL the window at least once to accomplish the task.



*FIGURE 2.24. LETTERHEAD #2.*

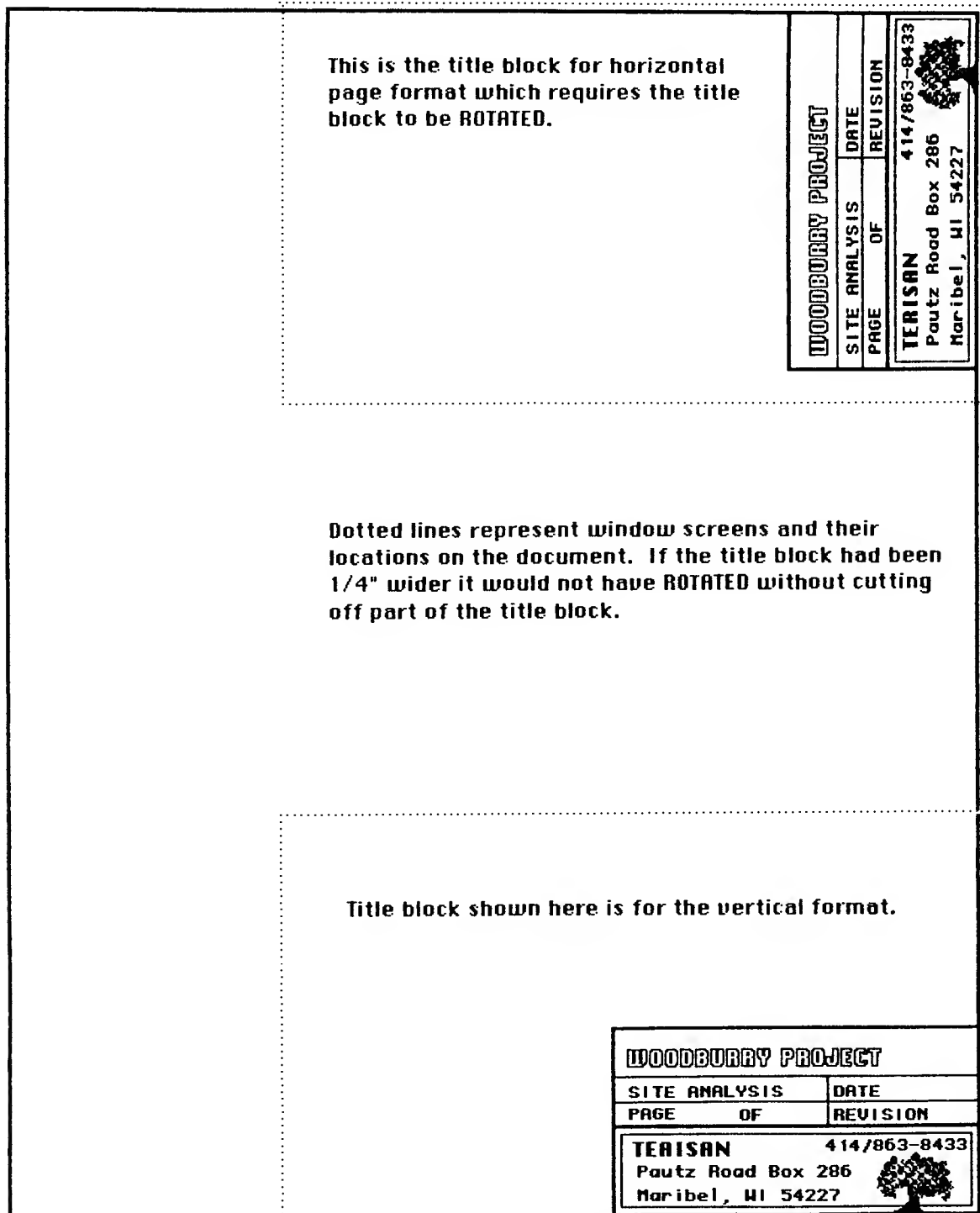
You may prefer to be more accommodating to the MacPaint environment by redesigning your letterhead to fit in one window, Figure 2.24. A letterhead that fits in one window can be more easily cut to the CLIPBOARD and saved on the SCRAPBOOK.

Along this same line, you will need to consider full page format. When printing a drawing, the paper rolls off the printer in a vertical format. However, many drawings are intended to be viewed on a horizontal format (Figure 2.25).



*FIGURE 2.25. Vertical and horizontal page format.*

Building a title block for each format will demonstrate the implications and procedures of horizontal and vertical formats. In creating a title block for an 8" x 10" blank drawing sheet, you may want to include the company name, project name, page number or revision number in the title block. You may also choose to include a border. Figure 2.26 shows the title block laid out for each format. Using

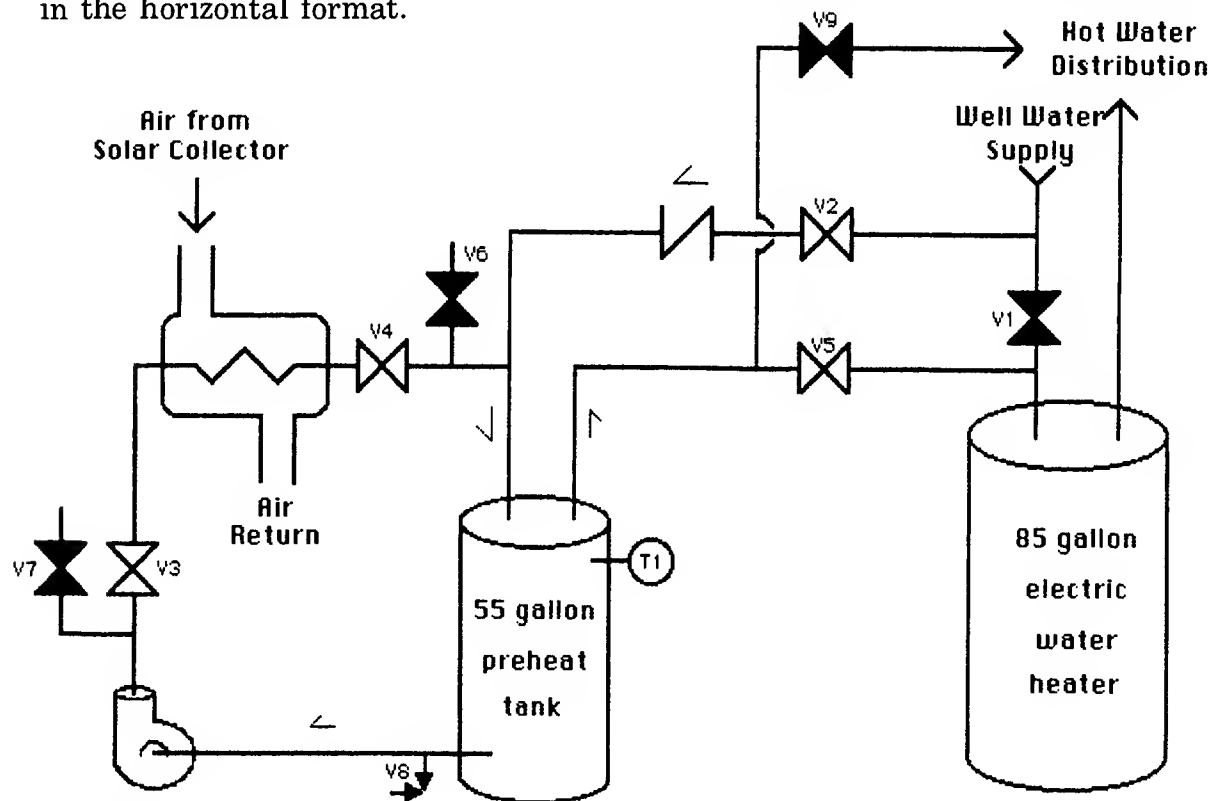


**FIGURE 2.26.** Title blocks in a vertical and horizontal page format.

ROTATE from the EDIT menu the title block will turn into its proper horizontal format after selecting ROTATE. If the title block had been much wider it would not have been possible to ROTATE it on one screen without segmenting and splicing it back together.

A horizontal page format means that everything drawn thereafter will have to be ROTATED or drawn on its side. A piping and instrumentation diagram has been drawn in both formats (Figures 2.27 and 2.28). In such a drawing, it is not difficult to draw simple shapes such as valve symbols in either format.

However, all text had to be ROTATED in the horizontal format. Drawings that are more complex will require thought and planning as to which format to use. These are considerations and decisions which you will need to be aware of since a drawing will take more time in the horizontal format. Perhaps you can find creative ways to display information in the vertical format as effectively as in the horizontal format.



#### NOTES

- 1 All tubing, fittings, and valves are copper, silver soldered.
- 2 Valves V6 & V7 for future connection to wood fired boiler.

| WOODBURY PROJECT     |  |          |
|----------------------|--|----------|
| PAGE                 |  | DATE     |
| OF                   |  | REVISION |
| TERISAN 414/863-8433 |  |          |
| Pautz Road Box 286   |  |          |
| Maribel, WI 54227    |  |          |

FIGURE 2.27. Piping diagram-- horizontal format.

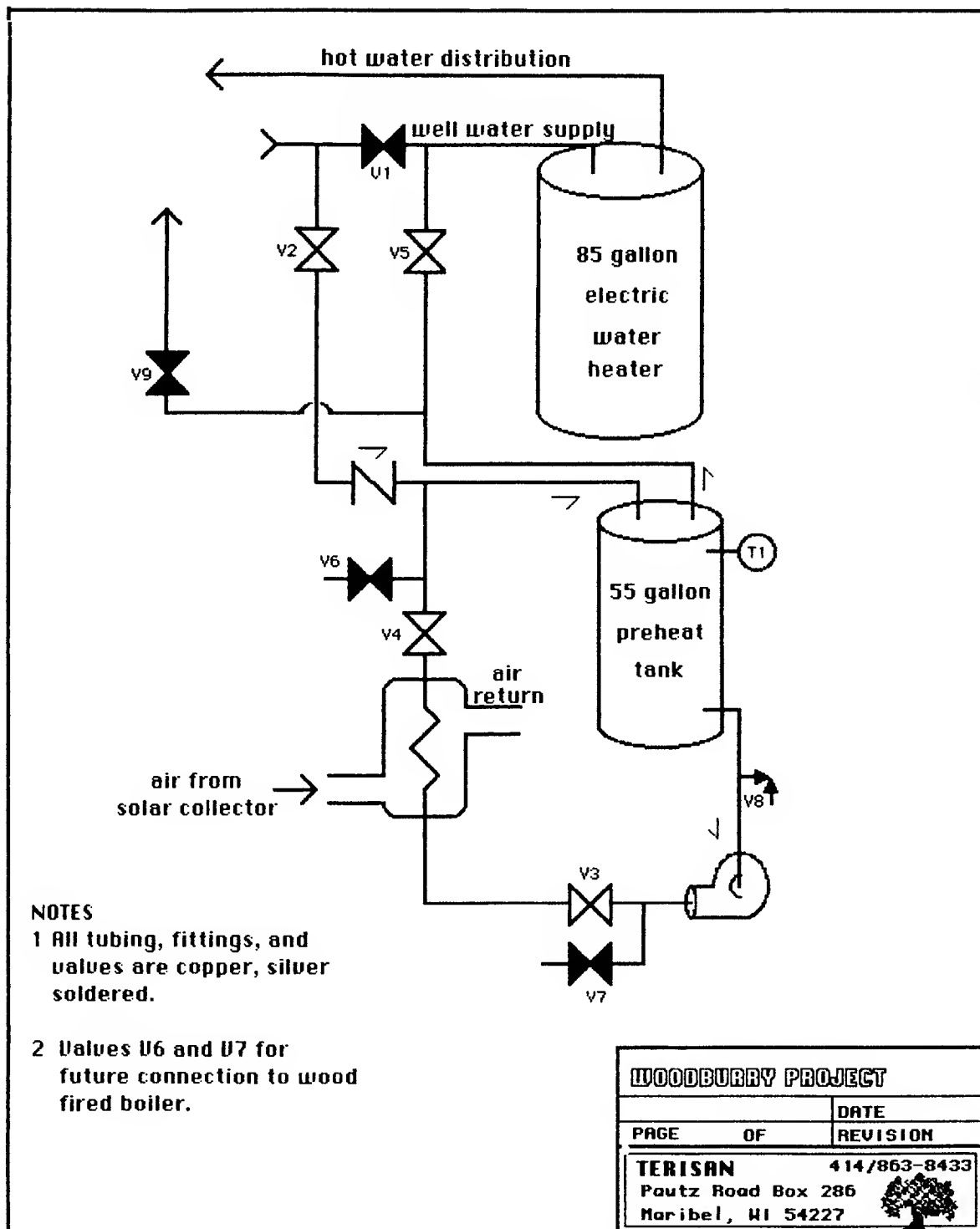
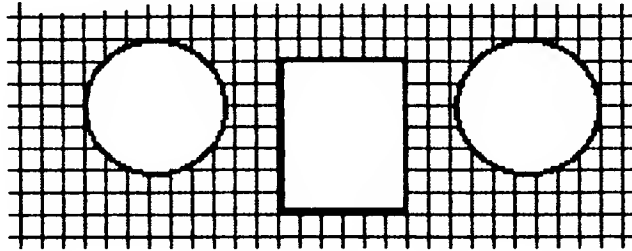


FIGURE 2.28 Piping diagram-vertical format.

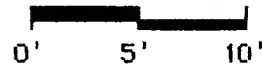
## Scale and Measure

Before finally beginning some drawing projects, we must address the subject of scale. When consistent proportions are required, there are two choices; working on a visible grid, or creating your own scale based on a grid.



**FIGURE 2.29. FILLED shapes on grid PATTERN.**

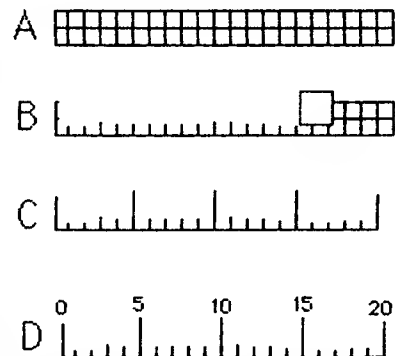
To work on a visible grid use the PAINT BUCKET and the grid PATTERN to fill the screen. When using white FILLED SHAPES, they will stand out on a grid with the grid serving as a good background (Figure 2.29). Slightly less than nine squares in the larger grid PATTERN equals an inch. About 17 small squares in the small grid PATTERN equals an inch. Because this is not a convenient scale when indicating scale of a drawing, it may be more appropriate to use a graphic scale rather than to say 1" = 10' (Figure 2.30). You can make a grid scale any unit of measure; feet, inches, centimeters, kilometers, or MacUnits.



**FIGURE 2.30. Graphic scale.**

If you prefer not to draw on a grid, create your own ruler. When a scale in the form of a ruler is created on one portion of the full page document, you can draw at the location of the scale. With the use of CLIPBOARD and SCROLLING, drawings are then moved to their final destination.

1. To create a scaled ruler, use the FILLED RECTANGLE with a grid PATTERN (Figure 2.31 A).
2. ERASE a portion of the grid (Figure 2.31B).
3. Determine the increments and values of the scale. Using the STRAIGHT EDGE, extend lines that divide the scale into convenient increments (Figure 2.31 C).

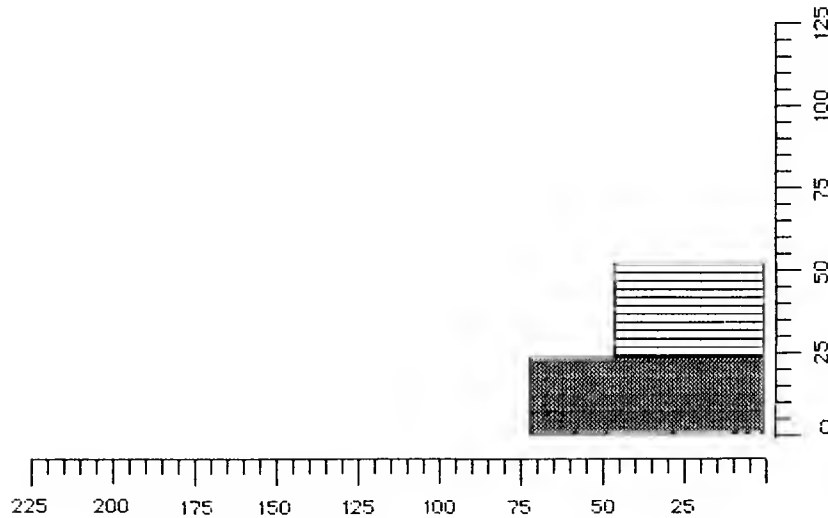


**FIGURE 2.31. Creating your own ruler.**

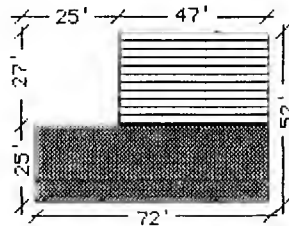
#### 4. Number scale using ALIGN MIDDLE from the STYLE menu (Figure 2.31 D).

To create a ruler up the side of the screen use the same technique and ROTATE or ROTATE portions of the existing scale.

Figure 2.33 was drawn next to the scale (Figure 2.32) then CUT, PASTED elsewhere, and labeled with dimensions using TEXT and ROTATE. Typeface was plain Geneva, and 9 point.



**FIGURE 2.32.** *Constructing a scaled building.*



**FIGURE 2.33.** *Scaled building moved to another drawing area and dimensioned.*

If this type of scale and measurement is convenient for your drawing needs, you may want to keep an unnumbered scale in your SCRAPBOOK. Chapter 4 (pages 128-134) has a more advanced discussion of scale, especially for full page drawings.

For small drawing tasks, it will sometimes be easier to use clear, plastic scales, rulers, or templates. A clear, plastic ruler can be an invaluable tool when hand held against the Macintosh screen. Whether you are measuring distance or angles, you can guide the pointer along these non-electronic tools. Later drawings use large circle templates hand held against the screen. **Don't hesitate to use whatever conventions or inventions you have at hand to make MacPaint more serviceable for you.**

## ***Problem Areas for New MacPaint Users***

Many icons and features in the menu bar have similar functions or results. Knowing which tool is most appropriate for the job at hand requires experience with MacPaint. Some guidelines are offered here to help sort out the differences.

### **PAINTBRUSH or PAINT BUCKET**

Size and complexity of an area to be covered in PATTERN determines whether an area should be filled using the PAINTBRUSH or the PAINT BUCKET. Since the PAINT BUCKET requires a complete enclosure, it may be preferable to use the PAINTBRUSH if there are several places in an area where paint might spill out. Experience will tell you if it requires more time to fill breaks to complete an enclosure or paint the PATTERN with a PAINTBRUSH. Taking advantage of the various sizes of PAINTBRUSH will allow you to quickly cover large or small areas with PATTERN.

### **PAINTBRUSH or SPRAY PAINT**

If you want shadows with hard edges that cannot be created with PAINT BUCKET use the large sizes of PAINTBRUSH to paint PATTERN. Casting shadows from a building would be an example. Any gradual blending of PATTERNS is best accomplished using SPRAY PAINT or smaller PAINTBRUSHES. For example, soft-edged shadows that might be used in portraits or landscapes would use the small or medium sized PAINTBRUSH. If larger areas are to be covered, use SPRAY PAINT. Shading of small areas is best done with very small BRUSH SHAPES.

### **LASSO or MARQUEE**

The deciding factor in moving or copying an image with LASSO or MARQUEE is whether the surrounding background is to be included and how close to another image the selected image will be located. Use the LASSO in the following instances:

1. When moving an image very close to or overlapping another image, use LASSO.
2. When a selected image is to be transparent to another, use LASSO.
3. When the images are to be CUT and PASTED into the SCRAPBOOK, use LASSO.

Use MARQUEE for the following purposes:

1. When using EDIT features, FLIP, ROTATE, INVERT, or TRACE EDGES, use MARQUEE.
2. When the image is rectangular, use MARQUEE.



When **FLIPPING** an image and moving it close to another image, use of both **LASSO** and **MARQUEE** will be necessary.

## **CUT or COPY**

**CUT** is used to remove an image from a document or the **SCRAPBOOK**. **COPY** makes a copy of the original, leaving the original where it was. Whether **CUT** or **COPY** is used, the image is sent to the **CLIPBOARD**.

## **CLIPBOARD or SCRAPBOOK**

The **CLIPBOARD** has only one page. That page is only large enough to hold one window's area of a drawing. The **CLIPBOARD** must be used to hold a drawing before transferring it to another document, another part of the same document, or to the **SCRAPBOOK**. The **CLIPBOARD** is used for immediate changes. Each time you use **CUT** or **COPY**, a new image replaces the previous image on the **CLIPBOARD**. The **SCRAPBOOK** has many pages, and is used to store drawings to be used in future documents. Each page of the **SCRAPBOOK** holds one window's worth of drawing, only part of a document page. This is the same amount of information that is stored on one page of the **CLIPBOARD**.

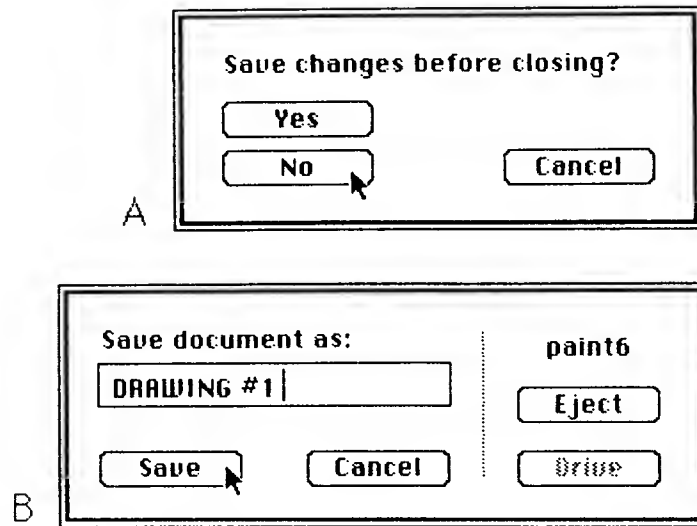
## **Losing Documents**

If you accidentally press the **CLOSE** box in the title bar or double click the **ERASER**, don't panic and don't click the mouse until you have selected **UNDO** from the **EDIT** menu. This will immediately return the drawing to the screen.

Saving your documents at least every fifteen minutes cannot be over-emphasized. When nearing the end of a drawing, you may prefer to save even more frequently. Fine details make a difference at the end of a drawing. If you lose part of a drawing due to power failure or a slip of the mouse, those final details may not be easily repeated.

In case you experience a power failure or you shut the machine off during a MacPaint drawing, Macintosh will rescue your drawing. Somehow, sometime, between the time the power fails or your finger hits the "off" switch and the time your drawing leaves the screen, something saves that document. If this sounds mysterious or magical to you, you aren't alone. The next time you turn on your Macintosh, a document entitled "rescue" will appear on the screen. If you don't save the document at that time it will be lost. For "rescue" to work properly, there must be two documents on view from the Macintosh desktop called "Paint1" and "Paint2". These two documents appear only when a "rescue" operation has occurred, but if you happen to delete or trash these two documents before you've **SAVED** your rescued document, you will have lost the document you were hoping to save.

## Dialogue Boxes



**FIGURE 2.34.** Dialogue boxes.

Dialogue boxes ask you for more instructions so that the Macintosh can proceed with its tasks (Figure 2.34). When using **SAVE AS** to save the document under a new name a dialogue box appears asking for the new document name. A dialogue box also appears when **CLOSING** a changed document or one that has not been previously **SAVED**. This is an opportunity to save the most recent changes of your drawing. In either dialogue box, “**YES**” sends the most recent document to the diskette to be saved. “**NO**” will not send the document to the diskette. Depending on which function was selected prior to the appearance of the dialogue box (**CLOSE** or **QUIT** from the **FILE** menu), the program will continue with the next function it has been ordered to perform. “**CANCEL**” is equivalent to “**NO**” but returns you to the normal drawing screen. In either case you will be returned to the drawing screen without any document changes being made to the diskette.

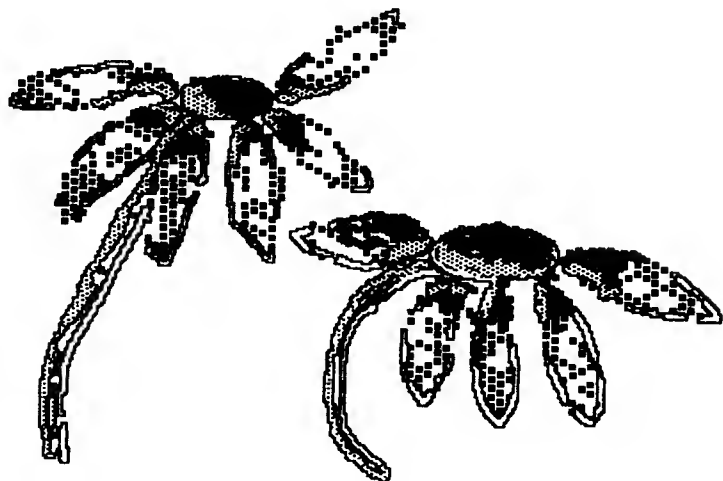
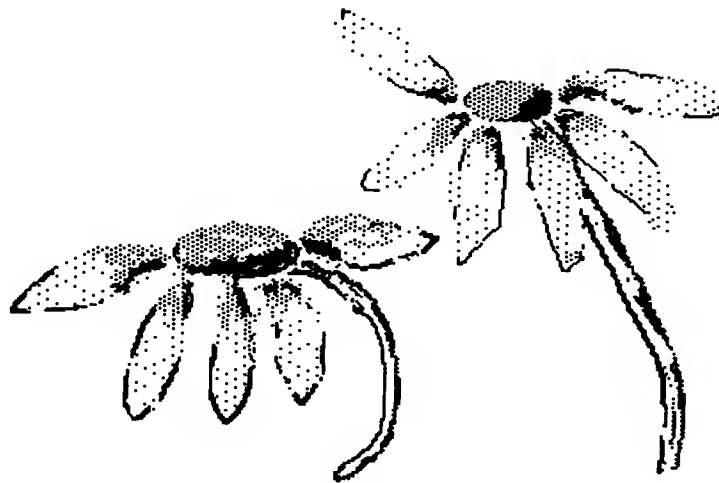
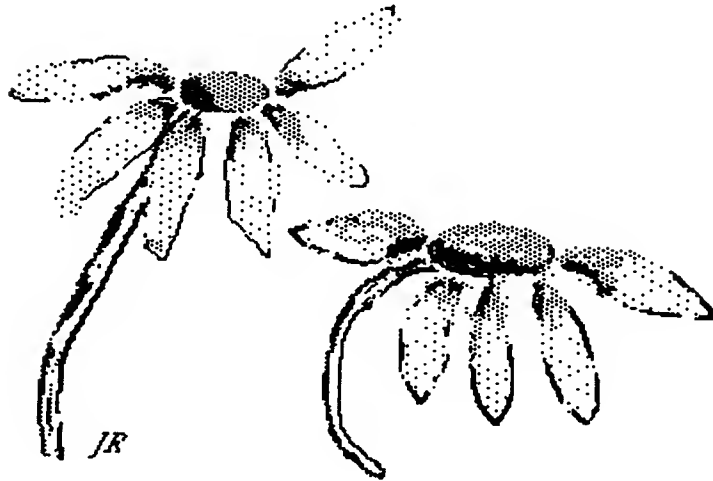
## Trouble-shooting Guide

Most of the problems addressed in the following table have been discussed previously. The table serves as a quick reference to some frequently occurring problems to new users. Appendix A provides a more complete discussion to the problems relating to full diskette storage.

| <b>PROBLEM</b>         | <b>CAUSE</b>   | <b>REMEDY</b>  |
|------------------------|--|--|
| Paint spills           | Enclosure not complete.  | Select UNDO and find where paint is spilling. Either change to PAINTBRUSH to paint PATTERN or complete the enclosure.        |
| No PENCIL lead         | Background changed.  | Click mouse button without sliding.  |
| Transparent image      | LASSO used to move an image which was not completely enclosed. LASSO saw the image as a line rather than a complete shape. | Use the MARQUEE or complete the shape by filling in missing dots or lines.   |
| Solid image            | Image was copied using MARQUEE or the image needed a break in its edge.  | Create a break in the image and use LASSO.   |
| Full diskette          | Too many drawing documents on diskette.  | Try CLEARING old images from SCRAPBOOK, this may be enough to finish current work. See Appendix A for diskette storage tips. |
| Patterns don't line up | Image containing first pattern was previously moved with LASSO or MARQUEE in a CUT/PASTE operation.                        | Erase first pattern & refill w/same pattern.   |



## Chapter 3 Beginning Drawings With MacPaint

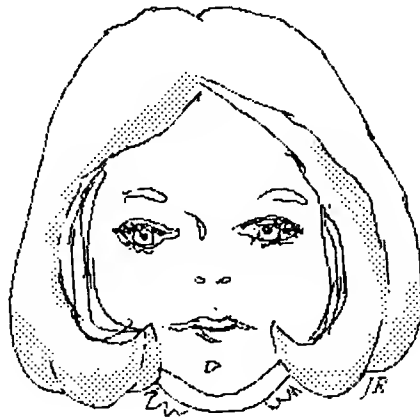


Beginning with a few simple drawings, you will be shown how to create controlled drawings with a variety of tools. There were many ways these drawings could have been created. It is a matter of personal preference and speed as to what your drawing tools and methods will be. As you become better acquainted with MacPaint you will discover the areas where you are most proficient while making new discoveries about MacPaint not covered in this book.

When you are just learning to draw with MacPaint, develop a thumbnail sketch on paper to compose a drawing, or as a learning tool, copy an existing drawing. Later, you may prefer to compose drawings directly on the screen. More complex drawings will benefit and time will be saved if preceded by a sketch on paper.

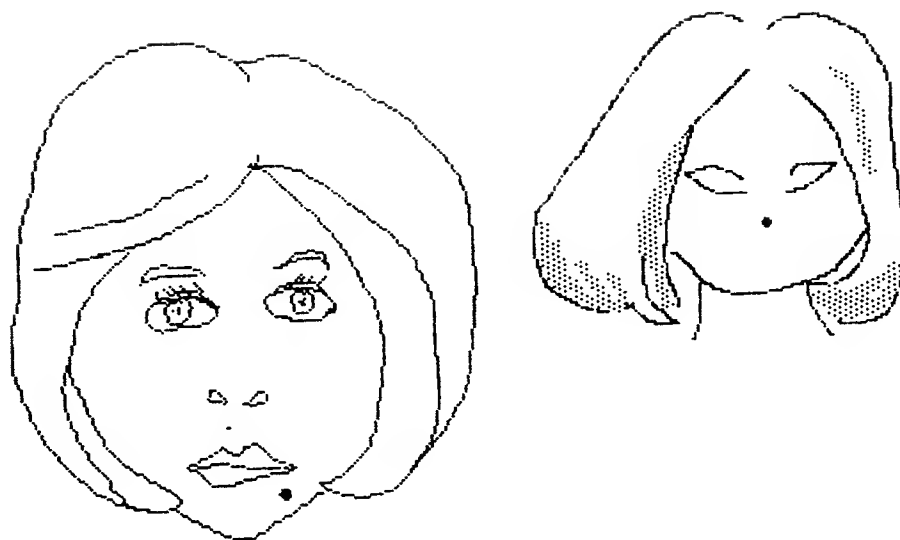
The purpose of the drawings in Chapter 3 is not to show you how to draw a cat, a girl's face, or any other object. Each of the drawings demonstrates a technique useful to many types of drawing in MacPaint. Learning to use different combinations of tools and techniques in a specific sequence is what this chapter is about. If you haven't drawn since the age of six, relax....and have fun. You may surprise yourself with hidden skills and talents.

## Girl

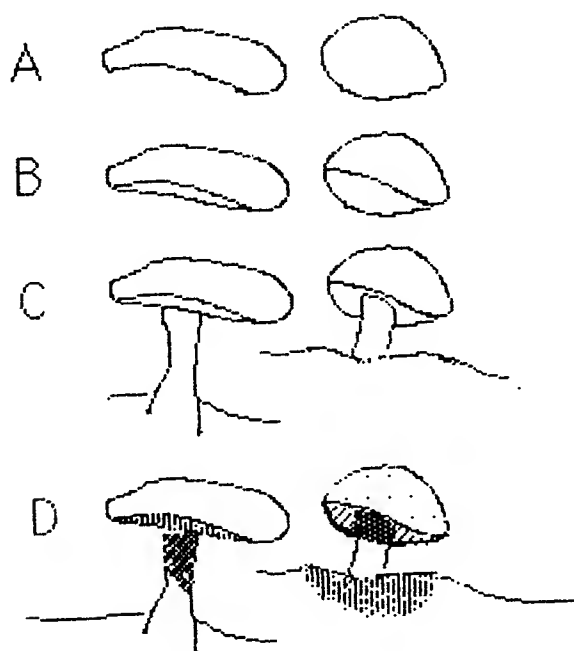


**FIGURE 3.1. GIRL.**

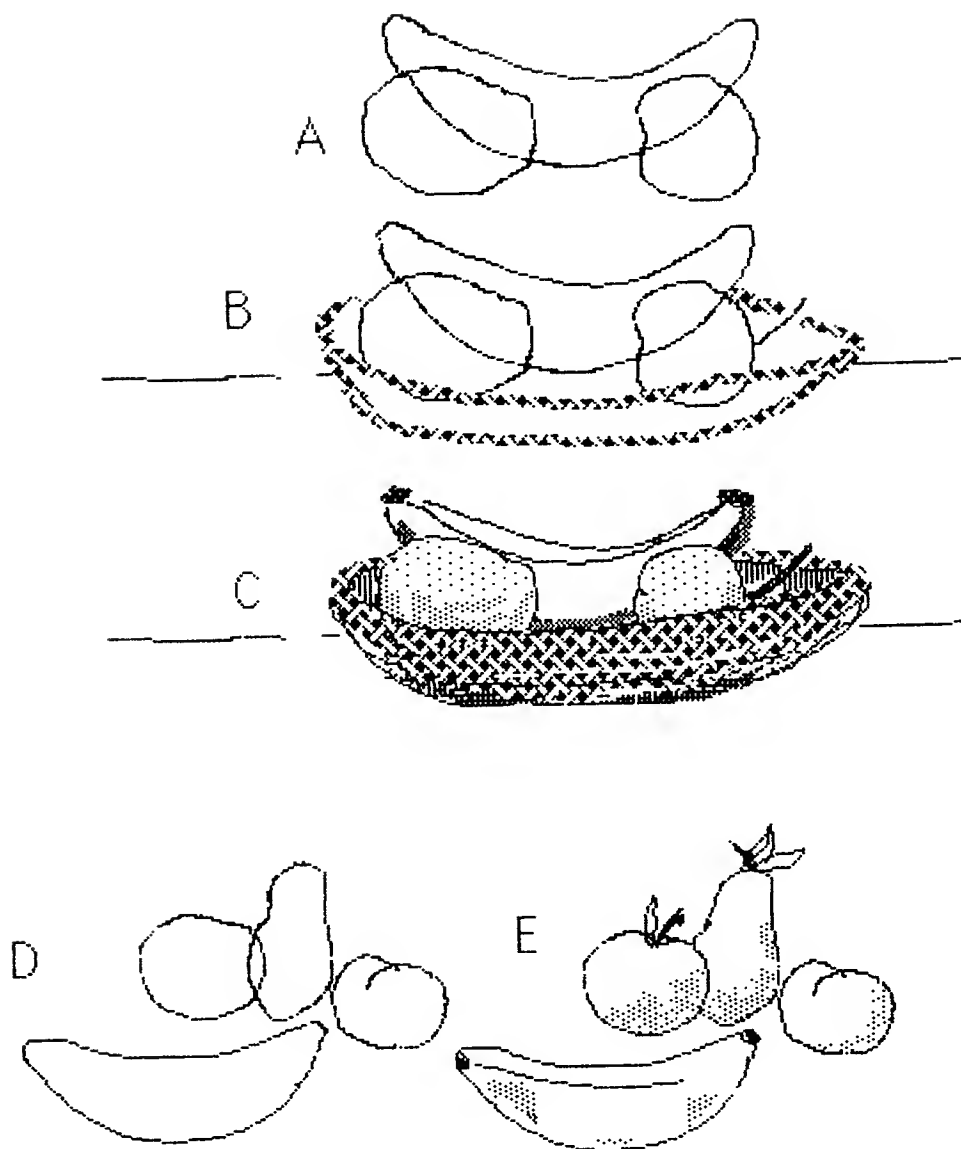
This is an example of an outline drawing. In these drawings (Figures 3.1 - 3.6), the objective is to use only the PENCIL and PAINTBRUSH. Keep in mind that white paint and PAINTBRUSH can be used as an eraser. Use the PENCIL to outline the girl's face and hair. Add shadows to her hair with the PAINTBRUSH. At first, your outline drawings with the PENCIL or even a PAINTBRUSH will be rough. In fact, your Girl may look more like those in Figure 3.2 than the Girl in Figure 3.1. Keeping your hand loose and comfortable on the mouse control will keep your drawing smoother than if you press hard or squeeze tightly on the mouse. After some practice you will be able to draw as easily with the mouse as with pencil and paper. So try a drawing now using only PAINTBRUSH and PENCIL.



**FIGURE 3.2.** *The Girl drawn by two other "MacPainters".*



**FIGURE 3.3.** *Turn shapes that are easy for you to draw into mushrooms or....*

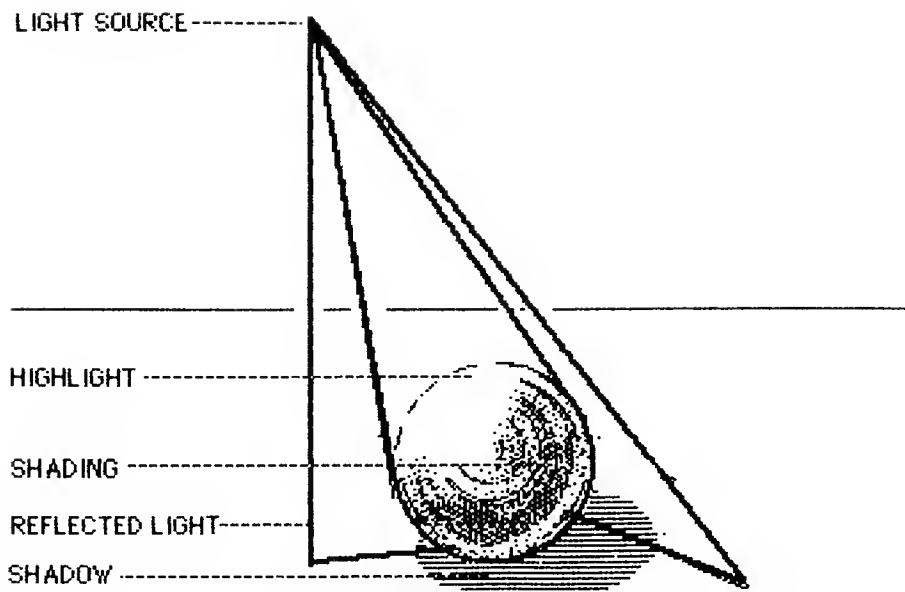


**FIGURE 3.4.** *Collections of fruit.*

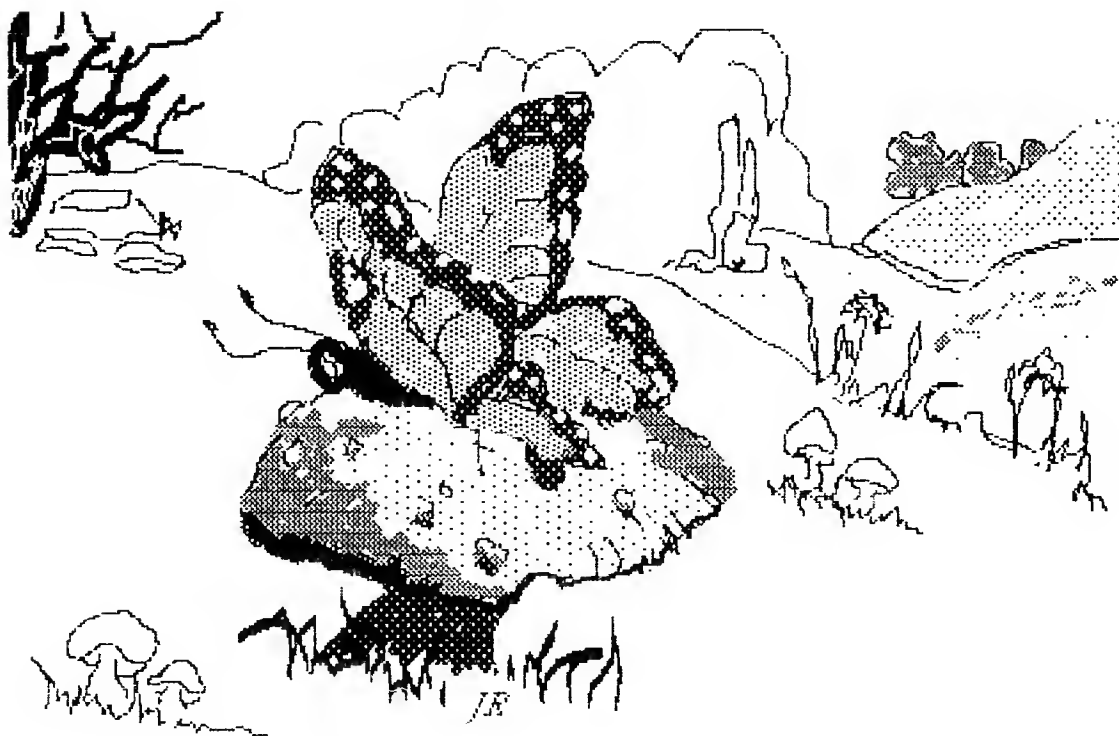
If you want to practice outline drawing and shading on a simpler topic, draw any easy shape and shade it. Mushrooms are easy to create (Figure 3.3). Loose sketching in Figure 3.4 developed into fruit arrangements. Don't avoid trying out the drawing exercises just because you think you can't draw or can't take the time to create more complex drawings. Simple irregular shapes can be used to learn the ways of MacPaint.

If you are not accustomed to shading, think about where the source of light is located in your drawing and where the shadows and highlights occur. Your drawing may reflect sunlight or a spotlight as the light source. Figure 3.5 shows typical light and shading patterns of a ball with a strong light source. For now, your drawings do not need to be this detailed with shading to produce effective MacPaint sketches. It is more important that you work at applying shadows or shading in a consistent direction.





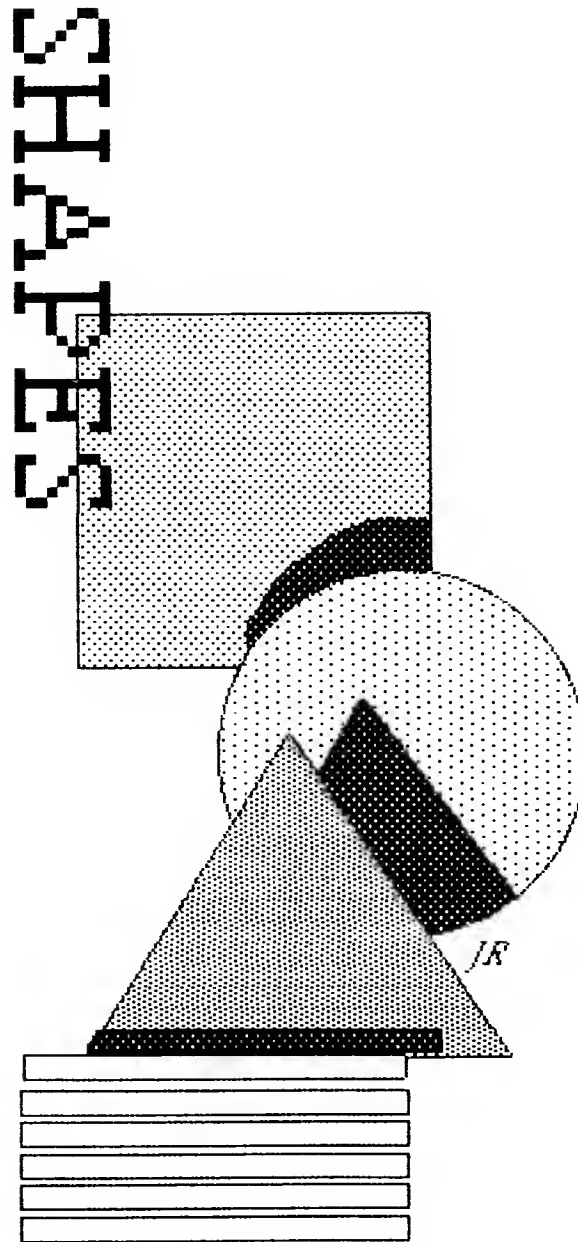
**FIGURE 3.5.** *Study of light and shadow.*



**FIGURE 3.6.** *Butterfly on a Toadstool.*

*Butterfly on a Toadstool* is a good example of what can be done with **PATTERN**. This quick sketch used the **PENCIL** for outlining and the **PAINTBRUSH** with various **PATTERNS**. The solid white **PATTERN** and the **PAINTBRUSH** were used to create white spots on the butterfly's wing.

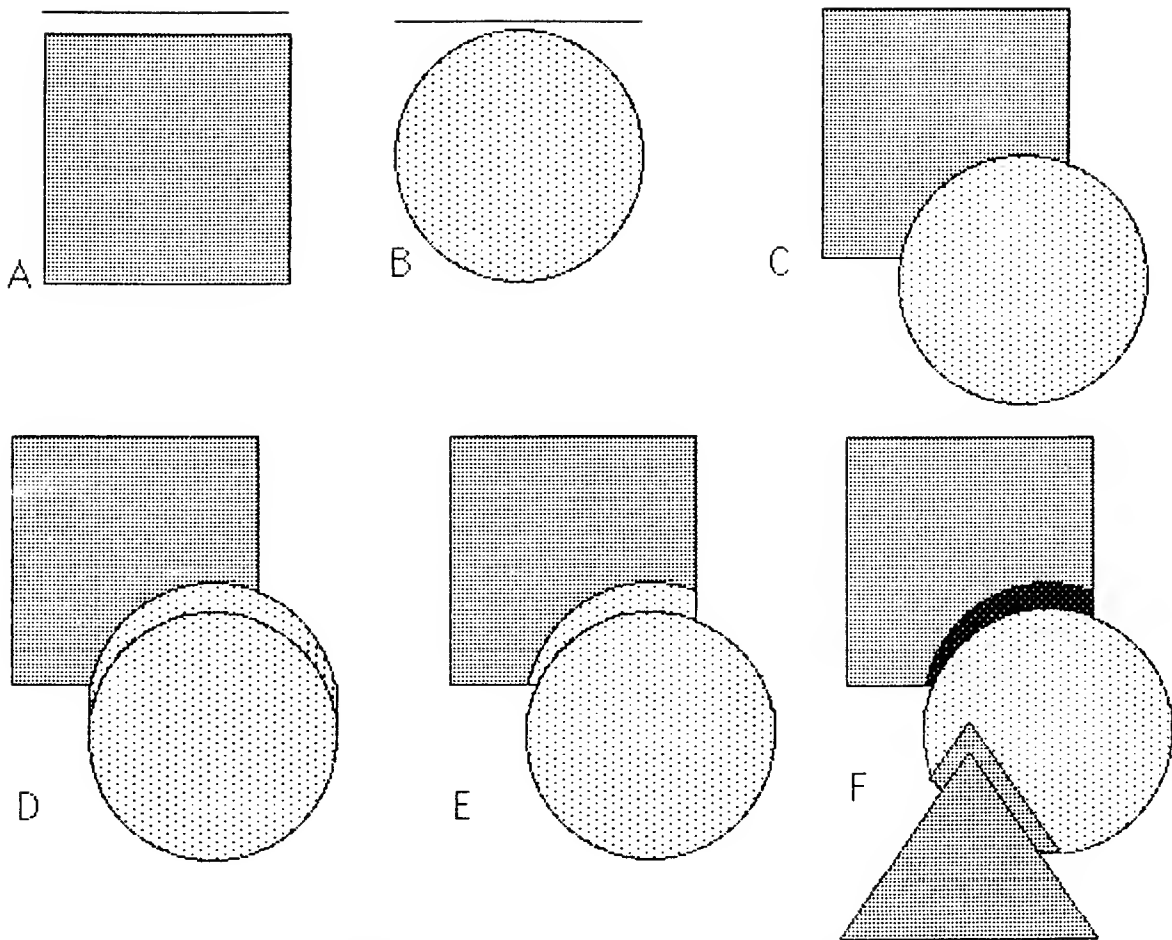
## Shapes I



**FIGURE 3.7.** Shapes I

Shapes I is a deceptively simple looking drawing but it is one of the most important exercises you will draw. The points to be learned are:

- \* **Controlling size of images**
- \* **Planning a drawing strategy**
- \* **Developing smooth access to all parts of the drawing page using SCROLL for window movement**
- \* **Developing smooth access between CLIPBOARD and various parts of a document page**



**FIGURE 3.8 A-F. Shapes development.**

Keeping these points in mind as you follow the development of *Shapes I*, let's begin by controlling the size of the shapes. The square, circle, and triangle base will all be the same width.

1. Draw a straight, horizontal line that will be the guideline for each shape's width, about 1 3/4". Using the **SHIFT** key and **FILLED RECTANGLE** draw a square under the guideline (Figure 3.8 A).
2. Using **LASSO**, move the guideline to another part of the screen to gauge the width of the circle. Using **FILLED OVAL** and the **SHIFT** key, draw the circle so that its diameter is not wider than the guideline (Figure 3.8 B).
3. **LASSO** the circle and move it over the square as shown (Figure 3.8 C).
4. While the blinking **LASSO** still surrounds the circle, press the **OPTION** key and the mouse button. Holding the mouse button and sliding the mouse forms part of a second circle that will become the circle's shadow (Figure 3.8 D).

5. Remove the shadow line that does not fall on the square (Figure 3.8 E). Fill in the shadow area with a darker PATTERN using either PAINT BUCKET or PAINTBRUSH.

By now, you will need to SCROLL the window down since the screen is full leaving no room for the triangle. Before SCROLLING, however, you will need to move your guideline to the next window screen to form the triangle base width which is consistent with the circle and square.

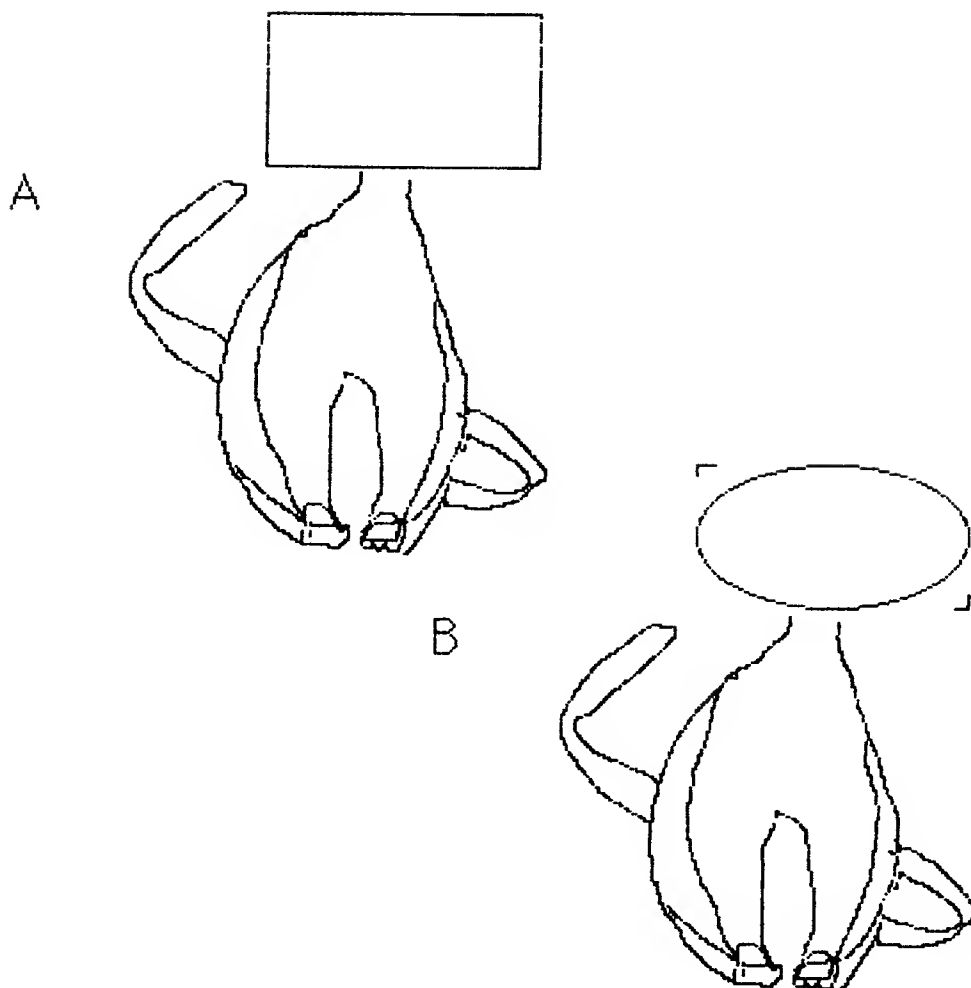
6. LASSO and CUT the guideline that automatically goes to the CLIPBOARD. Then, either select SHOW PAGE from the EDIT menu or double click the SCROLL icon. With the arrow inside the dotted window box, move the window box by pressing and sliding the mouse until the top of the box is lined up with the bottom of the square. Returning to the normal screen, retrieve the guideline from the CLIPBOARD and select PASTE. Place the guideline near the bottom of the screen.
7. Use the FILLED POLYGON or STRAIGHT EDGE to create the triangle, making its base the width of the guideline. Using the same technique that you used to move the circle, move the triangle so that it overlaps the circle and casts a shadow (Figure 3.8 F). You will find some difficulty in removing the shading that does not fall on the circle. When shapes overlap it is more difficult to know where the circumference lies on a circle as opposed to a square's perimeter.
8. Some commercial artists use text bars in their graphic art to place lettering. To create text bars in Shapes I use the widest BORDER LINE WIDTH and STRAIGHT EDGE. After all the bars are drawn, MARQUEE the bars and apply TRACE EDGES from the EDIT menu.
9. SCROLLING back to the top of the drawing, type "SHAPES" using 48 point, plain New York typeface. ROTATE the text while using the MARQUEE. Changing to the LASSO, move "SHAPES" into position with part of its letters overlapping the square.

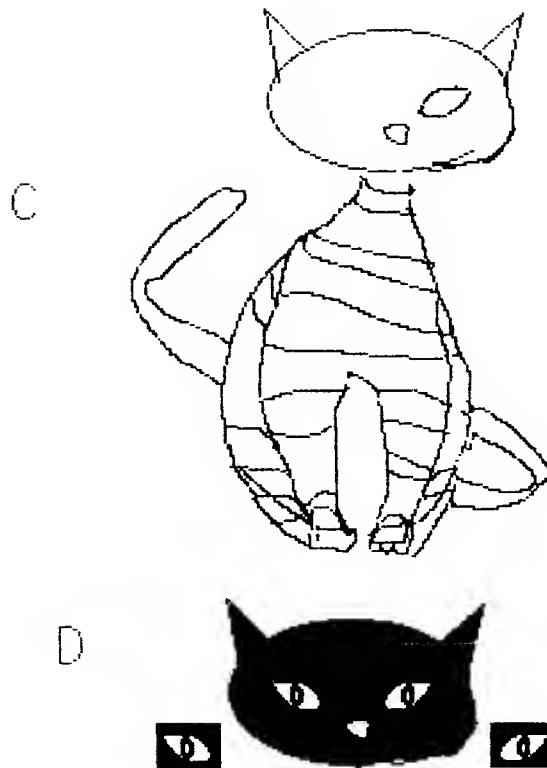
Although this composition was relatively simple, the methods used are methods which will be used for many drawings. As drawings become more complex, it will be important that you understand and become comfortable with LASSOING, COPYING, CUTTING, PASTING, and SCROLLING techniques. You will be using them more than any other tool, saving much time once you are accustomed to moving around the full page document, between documents, and the CLIPBOARD. Don't be timid with these tools. The faster you become acquainted with them, the faster you will gain proficiency with MacPaint's power.

## Alley Cat



**FIGURE 3.9.** Alley Cat.





**FIGURE 3.10 A-D.** *Alley Cat development.*

*Alley Cat* uses a variety of tools and techniques.

1. First, outline the cat's body using the **PENCIL** icon for rough composition.
2. Place the head in the proper location and proportion by placing a rectangle where the cat's head is to be.
3. **ERASE** most of the rectangle with the exception of two diagonally opposing corners. Using these corners as beginning and ending points for the **HOLLOW OVAL**, proper size and location for the *Alley Cat*'s face are assured.
4. Rough up the oval face to give the cat's face more character and cat-like features. Outline the nose and one eye on the cat's face with **PENCIL**.
5. After adding ears with the **HOLLOW POLYGON**, you can paint the head and ears with the **PAINT BUCKET** using the solid black **PATTERN**. Complete one eye using **FATBITS**. Once you have formed one eye nicely, move a copy out onto a free drawing area using the **MARQUEE**. While the blinking **MARQUEE** still surrounds the cat's eye, select **FLIP HORIZONTAL** from the **EDIT** menu. The cat's second eye is now ready to be moved into place.

6. The cat's stripes and tail can be filled with the black PATTERN using the PAINT BUCKET and the PAINTBRUSH. Use PAINTBRUSH and PATTERN to fill in thin stripes between the Alley Cat's front legs. Using FATBITS, remove a row of dots between the tail and body, and between stripes of back legs and forelegs. This distinguishes the parts of the Alley Cat's body more clearly. Continuing with FATBITS, clean up other ragged lines until Alley Cat has gained his personable character.

## Shapes II

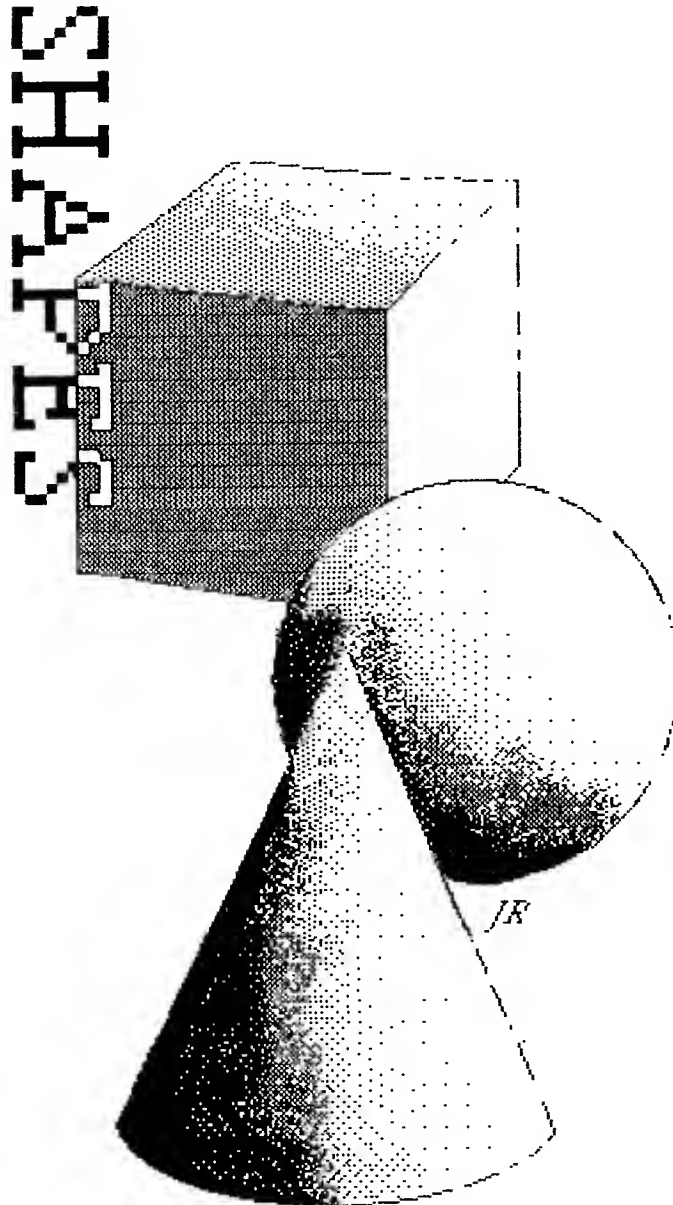


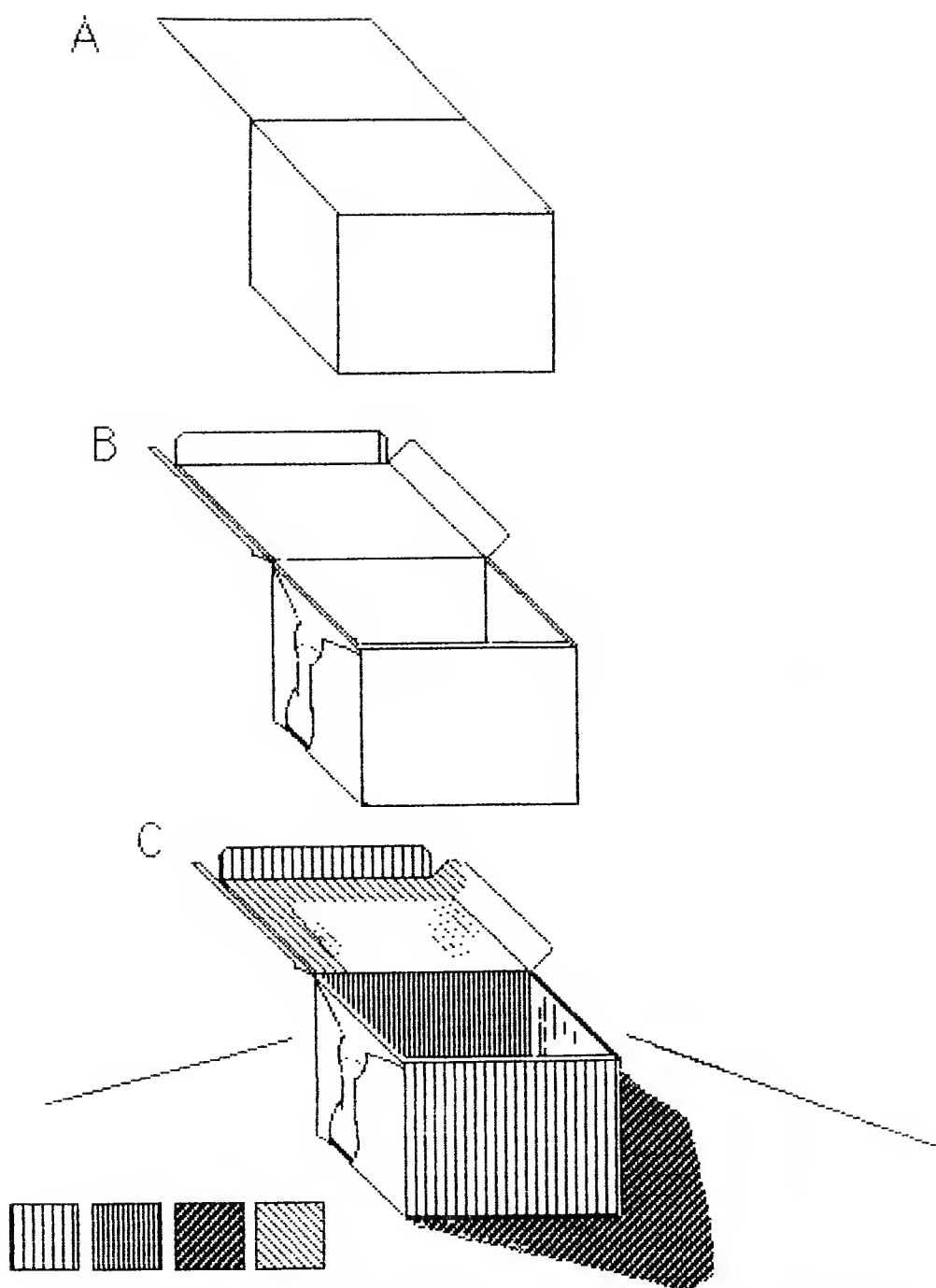
FIGURE 3.11. Shapes III.

Shapes II shows the effects of blending SPRAY PAINT and PATTERNS to give objects depth and volume. The drawing strategy is similar to Shapes I. Draw each shape separately using the HOLLOW RECTANGLE and the OVAL SHAPES

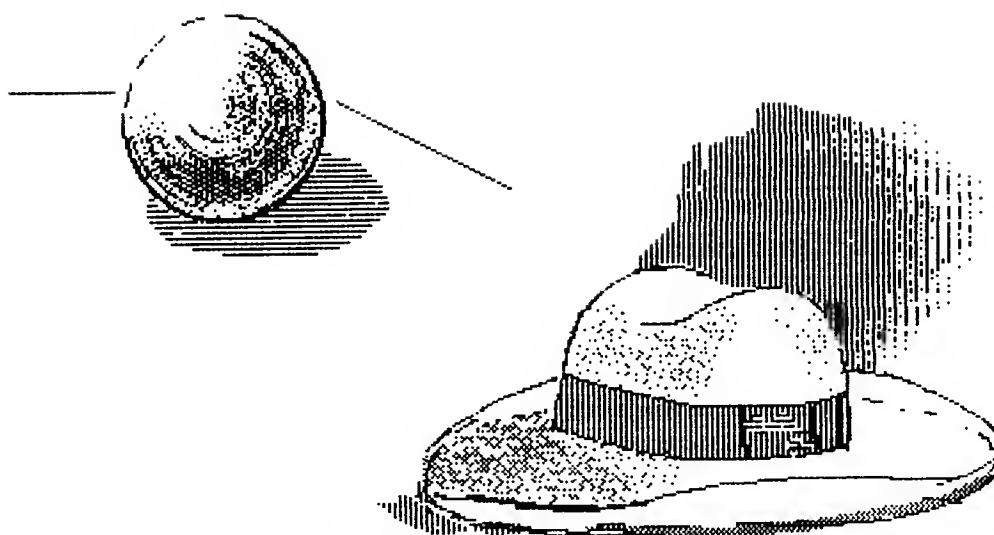
with the SHIFT key. The STRAIGHT EDGE is also used to create the cone and parts of the cube (see the cone in Chapter 2, page 81). Use the LASSO from the background to the foreground to overlap shapes. Select with MARQUEE the portion of the word “SHAPES” that overlaps the cube. Apply TRACE EDGES from the EDIT menu to the letters. This keeps the letters from getting lost against the dark shading on the face of the cube. Fill the face of the cube with grey PATTERN and PAINTBUCKET. When you apply shading to drawings with SPRAY PAINT, begin with the lightest side and work toward the dark. SPRAY PAINT the coarse dot PATTERN on the lighter sides of the shapes. For progressively darker areas, darker PATTERNS with greater densities of dots are used. Even the small grid PATTERN and the solid black PATTERN can be used by the SPRAY PAINT to create darkest shading.

If you have difficulty with shading and lighting, find some pen and ink drawing instruction books. A new edition of Arthur Gupitll’s book *Rendering in Pen and Ink*, (edited by Susan E. Meyer and published by Watson-Gupitll Publications, New York, 1976) provides many good illustrations that conform nicely to MacPaint’s style. Pen and ink drawings are usually small because pens generally have fine, stiff points, capable of holding a small amount of ink. This makes creating large drawings impractical. When using MacPaint, we are creating small drawings, not limited by the tools but rather by screen size. In pen and ink drawing, there are no shades of grey, just black and white. In both MacPaint drawing or pen and ink drawing, shadows and shading are created by varying the width and density of lines or dots. When you use PATTERNS for shading, they are most frequently dots and lines of varying widths and densities. Figures 3.12 and 3.13 are based on drawing examples found in *Rendering in Pen and Ink*. Try experimenting with lines, dots, and PATTERNS to create a range of greys. You may even want to experiment with new patterns through EDIT PATTERN. Figure 3.15 shows PATTERN EDITS which were used to create new grey scales. Finding different ways to create shading and shadows will make your drawings more interesting.

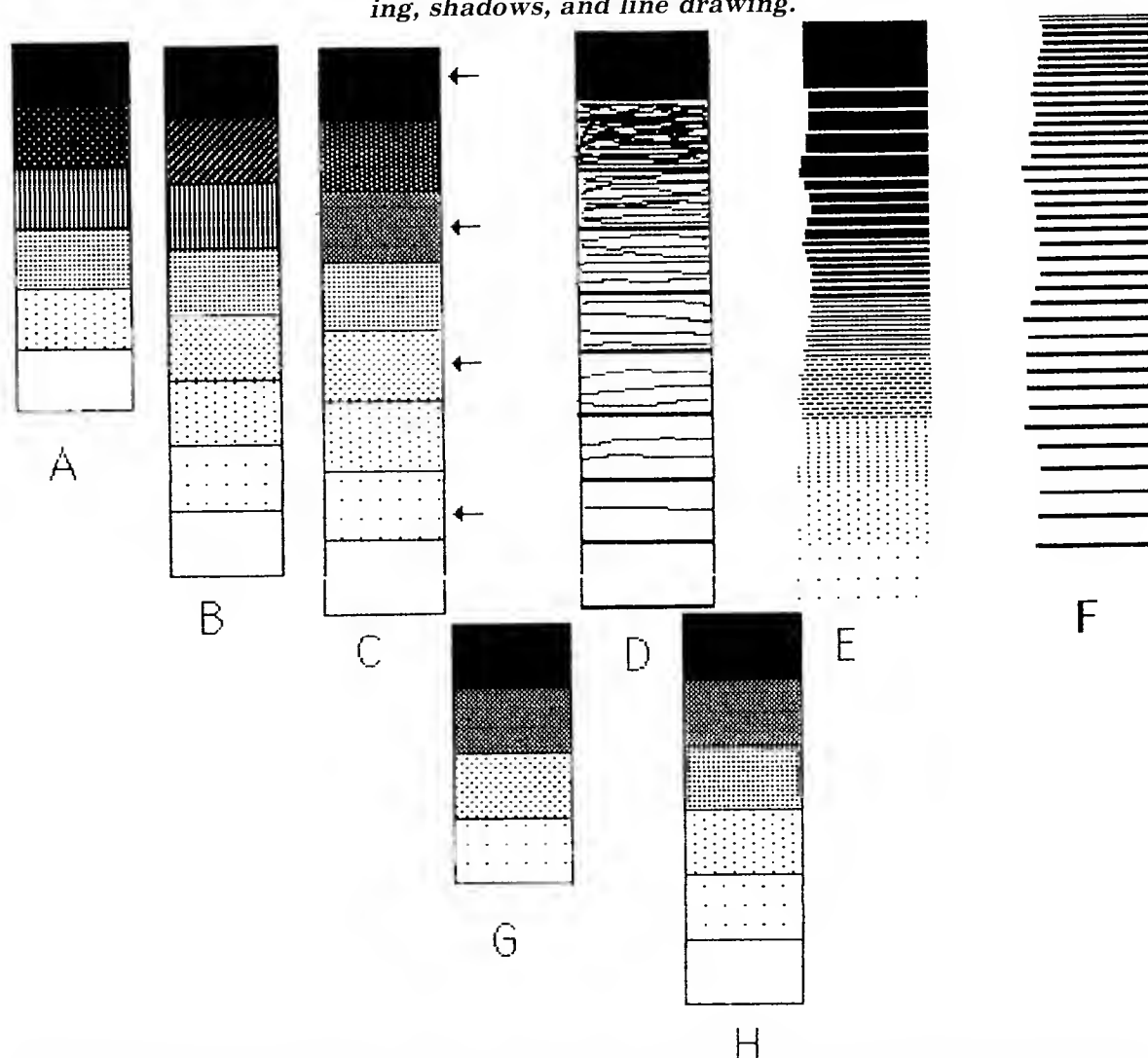




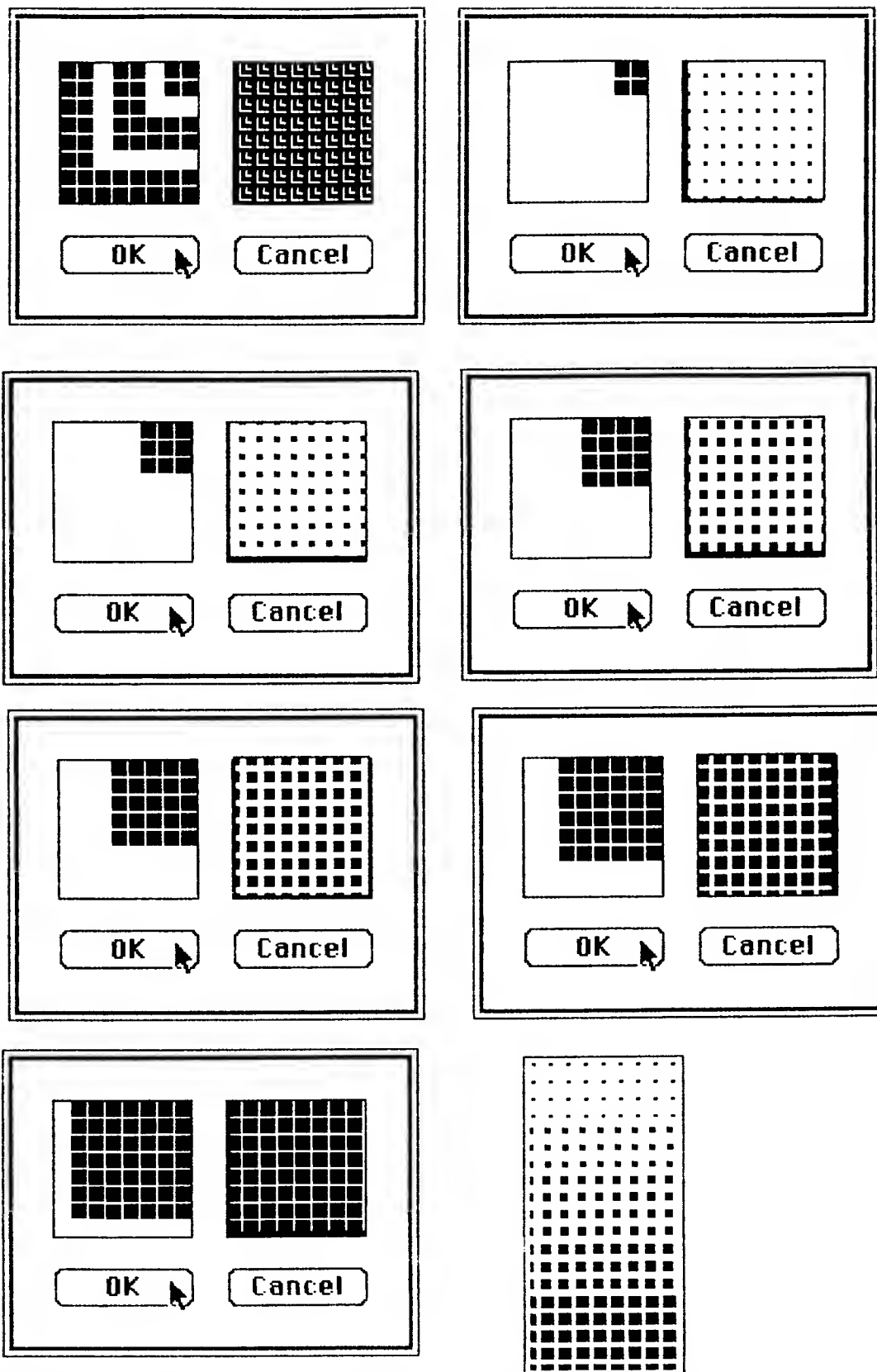
**FIGURE 3.12 A-C.** Four **PATTERNS** were used to shade the box.



**FIGURE 3.13.** *Borrowing from pen and ink drawings can teach you much about shading, shadows, and line drawing.*

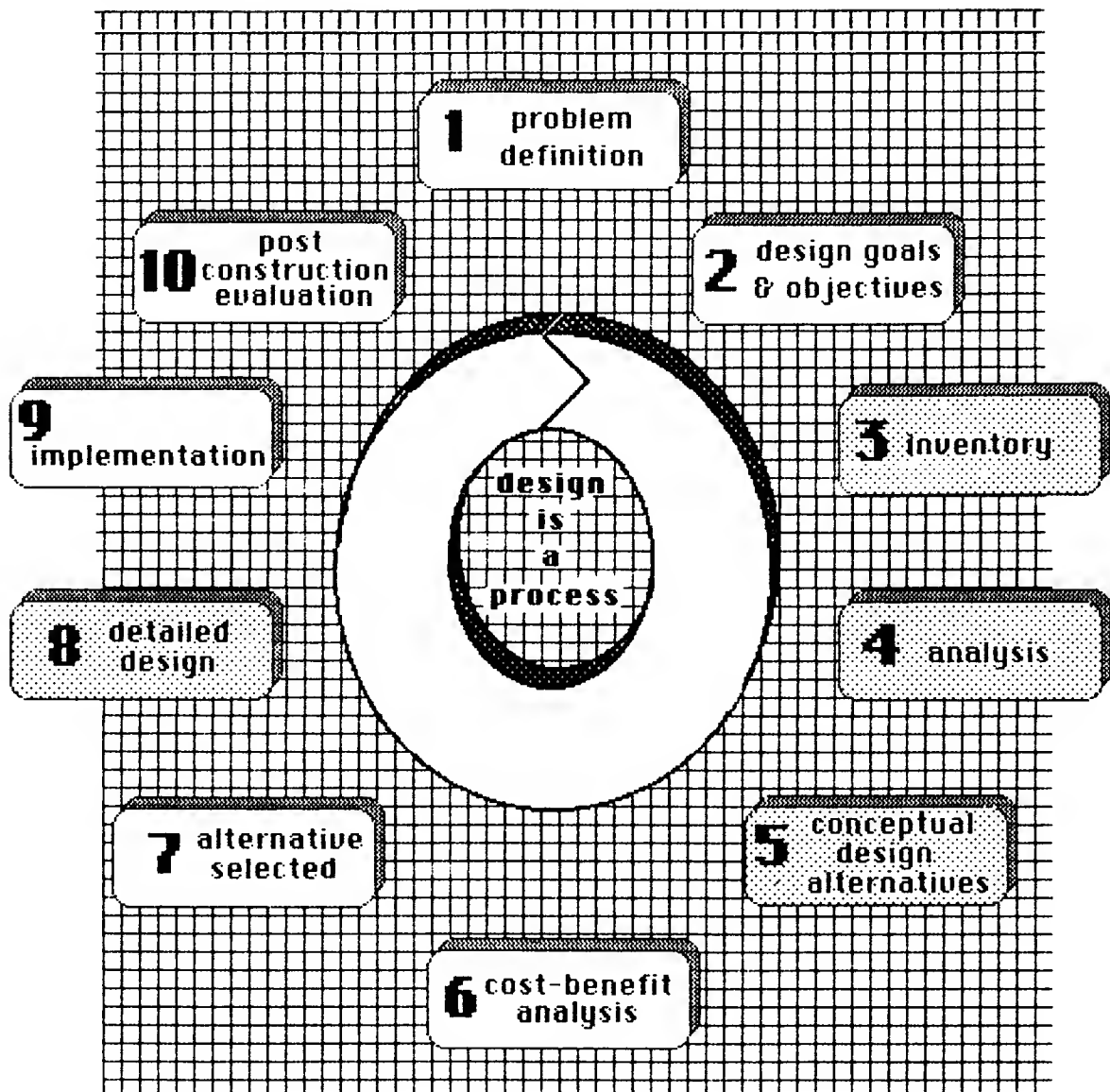


**FIGURE 3.14 A-H.** *Grey scales—Scale G was extracted from scale C. Scales D and F were created with PENCIL and STRAIGHT EDGE varying only line spacing.*



**FIGURE 3.15.** Create your own patterns through *PATTERN EDIT* and build your own unique grey scale.

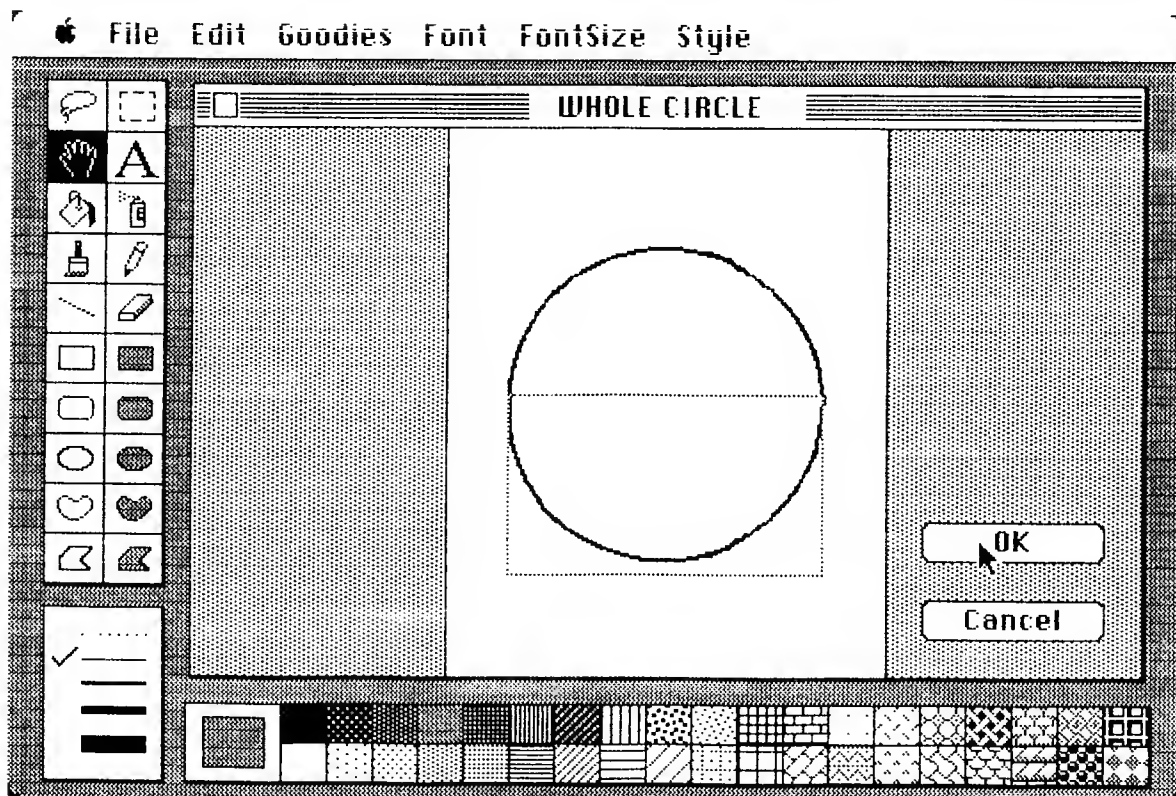
## Flowchart



**FIGURE 3.16.** Flowchart.

The most difficult lesson of the Flowchart (Figure 3.16) is the large circle upon which the design process elements—the rectangles—are located. Creating the circle requires two window screens with one-half of the circle filling each screen (Figure 3.17 and 3.18).

1. Using the **SHIFT** key and the **HOLLOW OVAL** draw a circle.
2. **ERASE** the top or bottom half of the circle.
3. **MARQUEE** the half circle. Using the **SHIFT** and the **COMMAND** keys, stretch the half circle until it fills the screen.
4. With the blinking **MARQUEE** still around the half circle, **COPY** it to the **CLIPBOARD**.
5. **SCROLL** the window down until only the ends of the half circle show in the new window location.
6. **PASTE** the half circle from the **CLIPBOARD** in the new window location. While the blinking **MARQUEE** line still exists, select **FLIP VERTICAL** from the **EDIT** menu.
7. Changing the **MARQUEE** to a **LASSO**, select the half circle and move it up to match the ends of the first half circle (Figure 3.19). The resulting 5 1/2" diameter circle becomes the guide for arranging the Flowchart (Figure 3.20).



**FIGURE 3.17.** After **FLIPPING VERTICALLY** the lower half circle, it was joined with the upper half circle using **LASSO**.

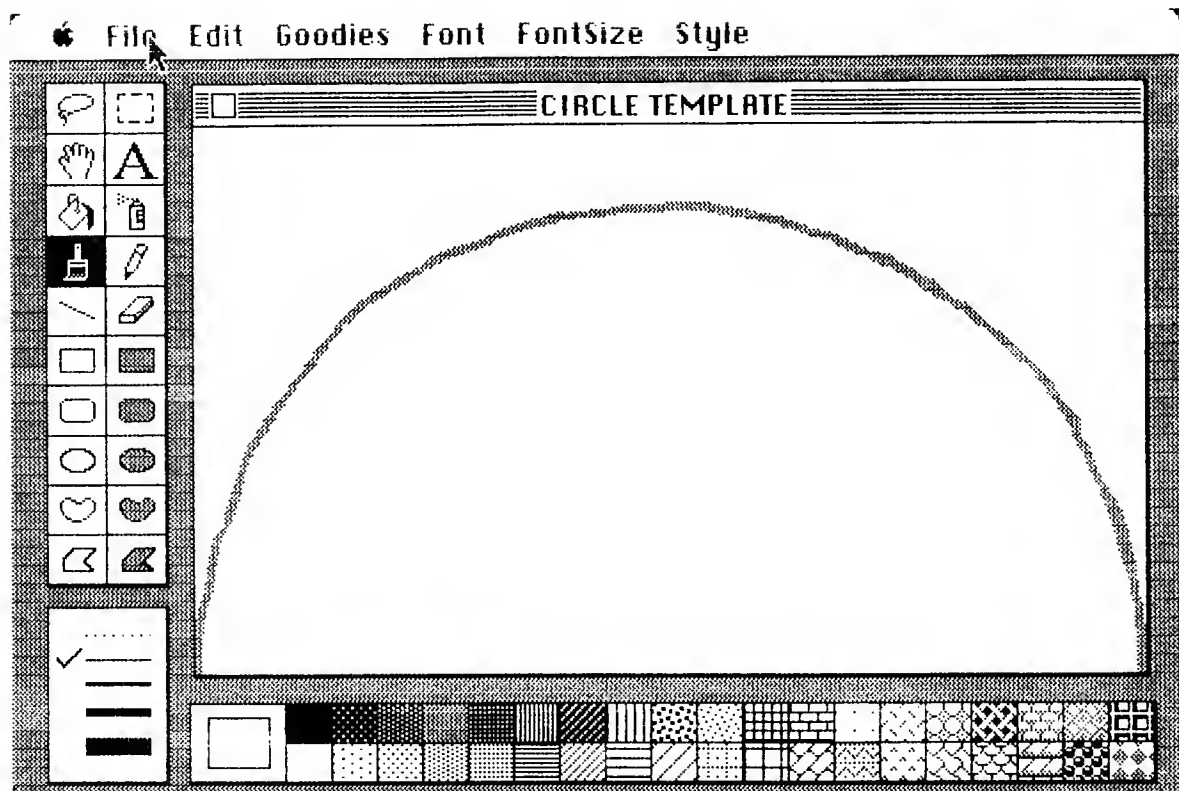


FIGURE 3.18. A large half circle can also be developed by tracing **PAINTBRUSH** around a clear, plastic circle template which is hand held against the screen.

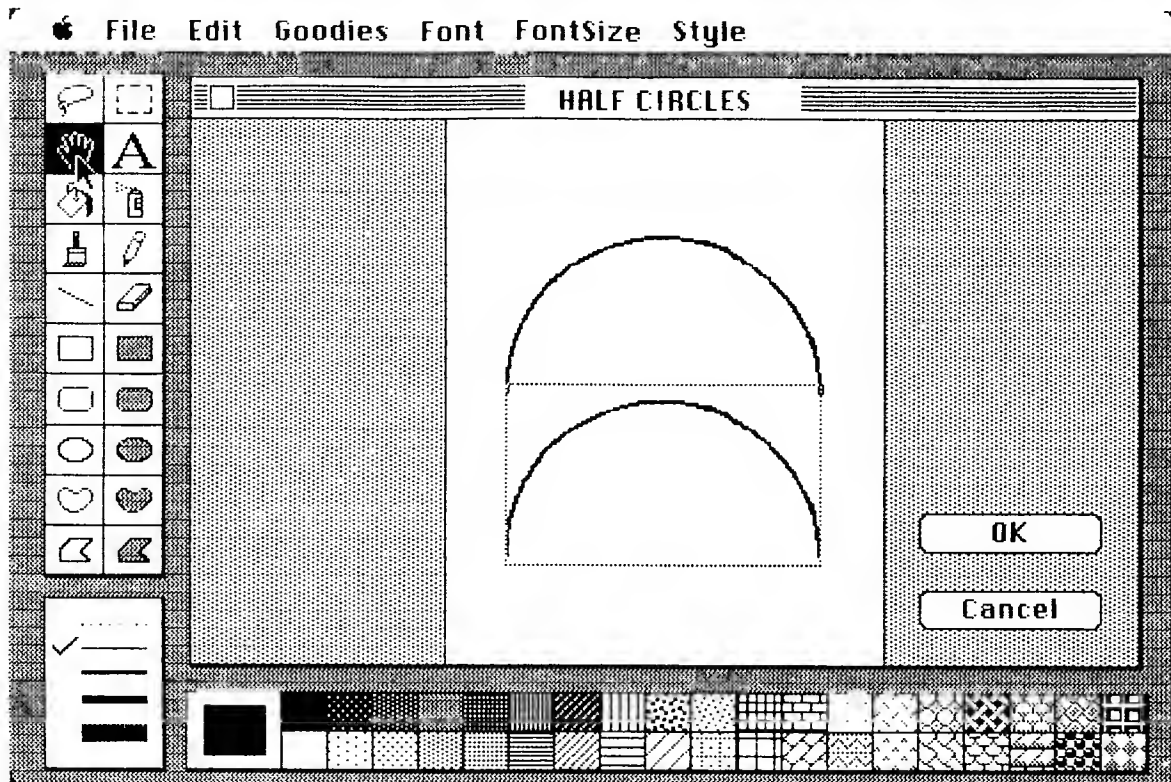


FIGURE 3.19. Half circle is **COPIED** and **PASTED** in new window location.

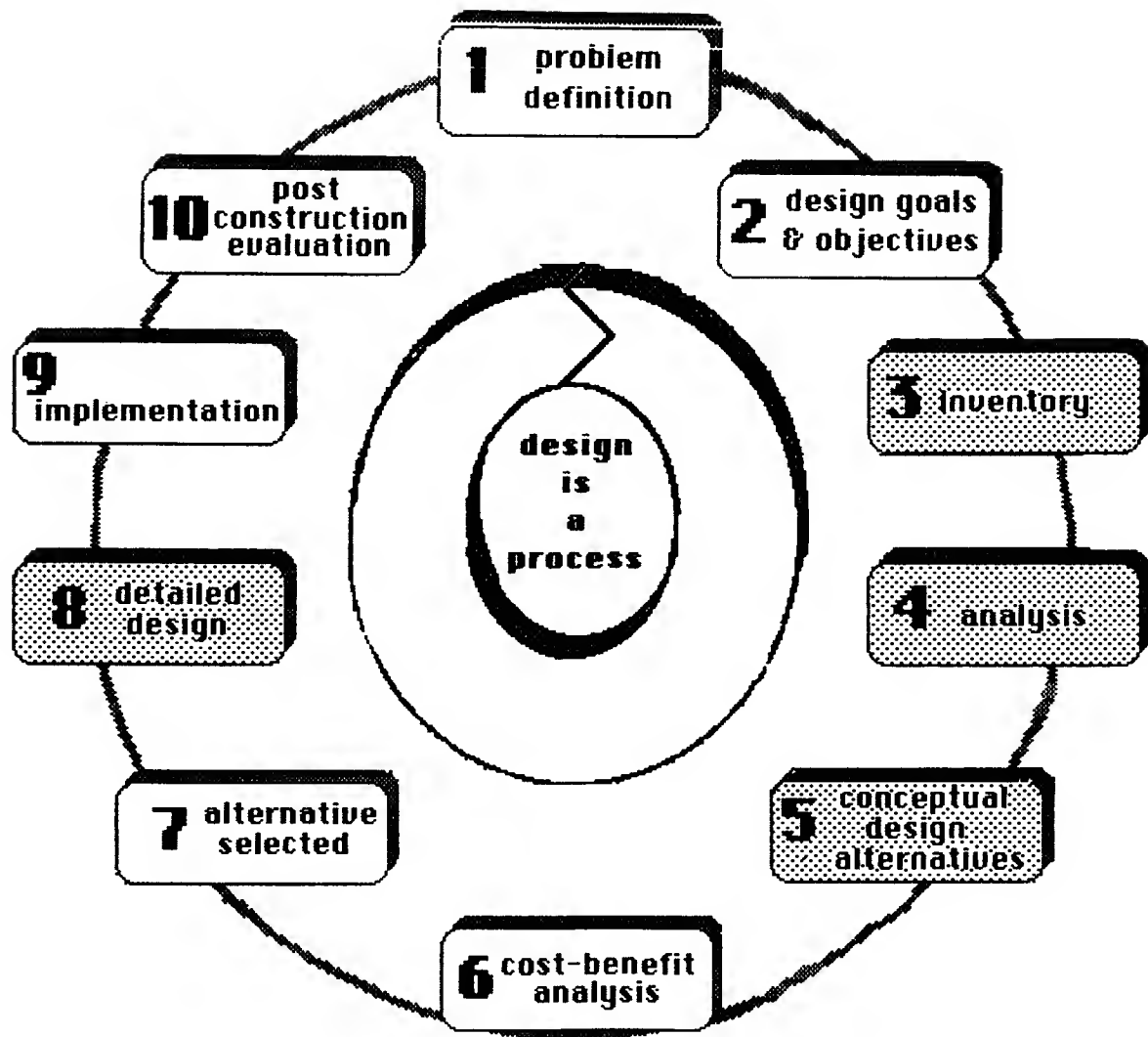


FIGURE 3.20. The circle was the guide for the flowchart's components.

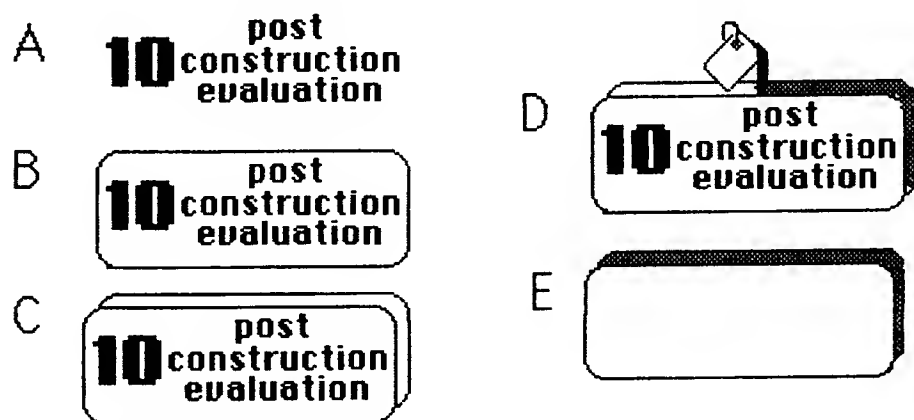


FIGURE 3.21 A-E. Development of the flowchart's elements.

Draw each element in *Flowchart* with the HOLLOW ROUND-CORNERED RECTANGLE. Determine the size of the rectangle by typing the longest text needed for *Flowchart* (Figure 3.21 A) and placing the HOLLOW ROUND-CORNERED RECTANGLE around it (B). Next, LASSO the rectangle and move it slightly using the OPTION key (C). Fill the second rectangle with shading (D). ERASE the text from this rectangle. All other shaded rectangles are then copied from this original using LASSO and the OPTION key. Each rectangle is filled with TEXT using MIDDLE ALIGN, 12 POINT, and PLAIN CHICAGO type.

Create the *Flowchart* center with the HOLLOW OVAL SHAPE. LASSO the oval and move it slightly with the OPTION key to form a second shadowed oval. Use the dark, dotted PATTERN and the PAINT BUCKET to shade the second oval. Carefully erase the circle guide using ERASER and FATBITS. The fine dot PATTERN with the PAINTBUCKET can be added to some rectangles for emphasis. For aesthetic considerations you may want to add a grid PATTERN with the PAINT BUCKET. Finally, it is necessary to remove some of the dot and grid pattern away from the text using FATBITS. Cleaning up the pattern around the text keeps the text clear and legible.

A question might be raised, why the *Flowchart* was not constructed from the background to the foreground beginning with a grid. Placing rectangles on a grid might have assured accurate placement in less time. It would require less than a minute to surround the flowchart with the grid. To erase the grid around all the rectangles takes a good, tedious, 10 - 15 minutes. Since we weren't sure the flowchart should be sitting on a grid, the grid needed to be added last. Anytime you use PAINT BUCKET and PATTERN as background to a drawing that is well along, don't be too quick with clicking the mouse. Rather, fill in the PATTERN one area and one click at a time. Leave yourself time to examine the results with both alternatives by selecting UNDO several times.

Testing a variety of PATTERNS against one another by selecting UNDO after each PATTERN change and addition gives you the opportunity to test out the effects before making final decisions. Erasing a background PATTERN away from other images is boring, tedious, and time consuming.

With MacPaint, it is not difficult to take a drawing too far, too quickly. If a document has been saved frequently, REVERT, from the FILE menu can be a life saver. Selecting REVERT will clear the document from the screen and replace it with the version last saved. If I had SAVED *Flowchart* before adding the grid, I could have REVERTED to that document if I had decided the grid on the entire flowchart was too much. So, testing a background PATTERN one area at a time, or SAVING a document just before adding the PATTERNED background would give you more choices and opportunities to make better design decisions.

A third possibility for keeping options open can be used when plenty of space is available on the diskette. Save different versions of a drawing under different names. Selecting SAVE from the FILE menu replaces the previously saved docu-

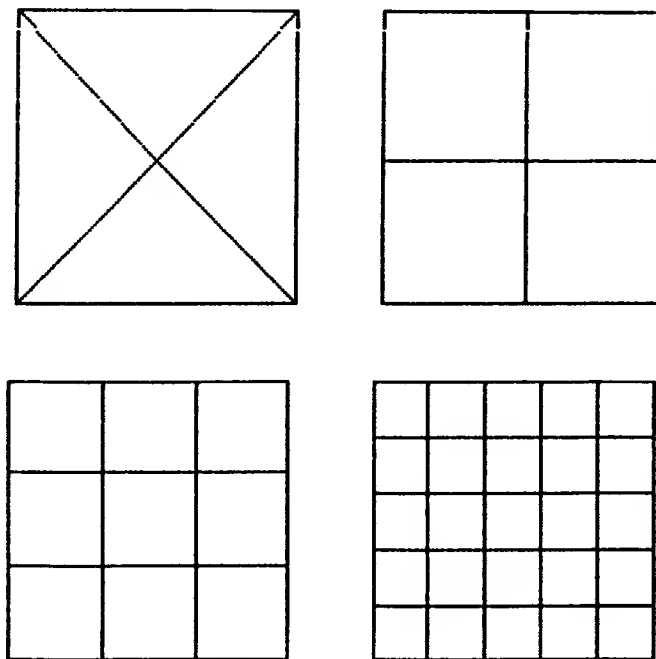


ment with the current version—with no questions asked. **SAVE AS**, on the other hand, saves the document separately under a new name. A dialogue box appears asking for the name under which the document is to be saved. We could have **SAVED Flowchart 1** without the grid. Then **Flowchart 1** could have been **SAVED AS Flowchart 2** with the grid.

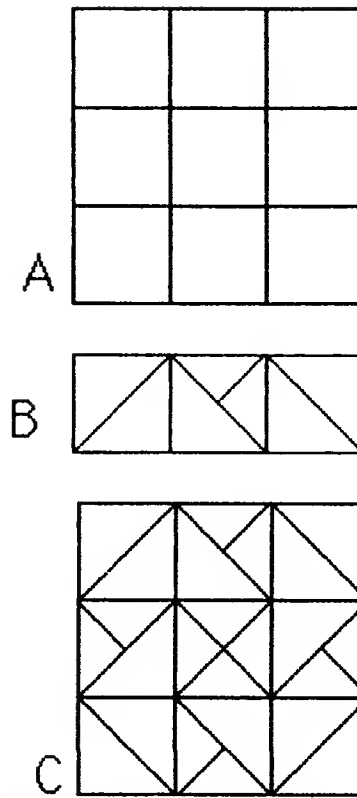
Whichever method you use, the point of each is to keep drawing and design options open. This gives you opportunities to make wise design decisions without needing to erase or redraw.

## Quilting

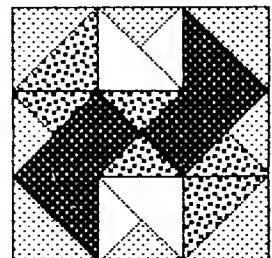
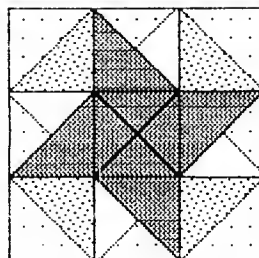
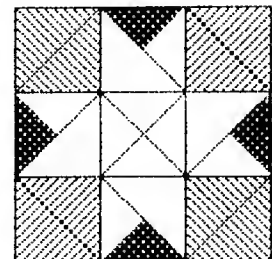
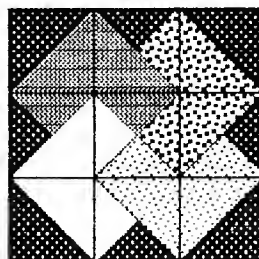
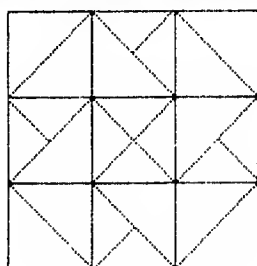
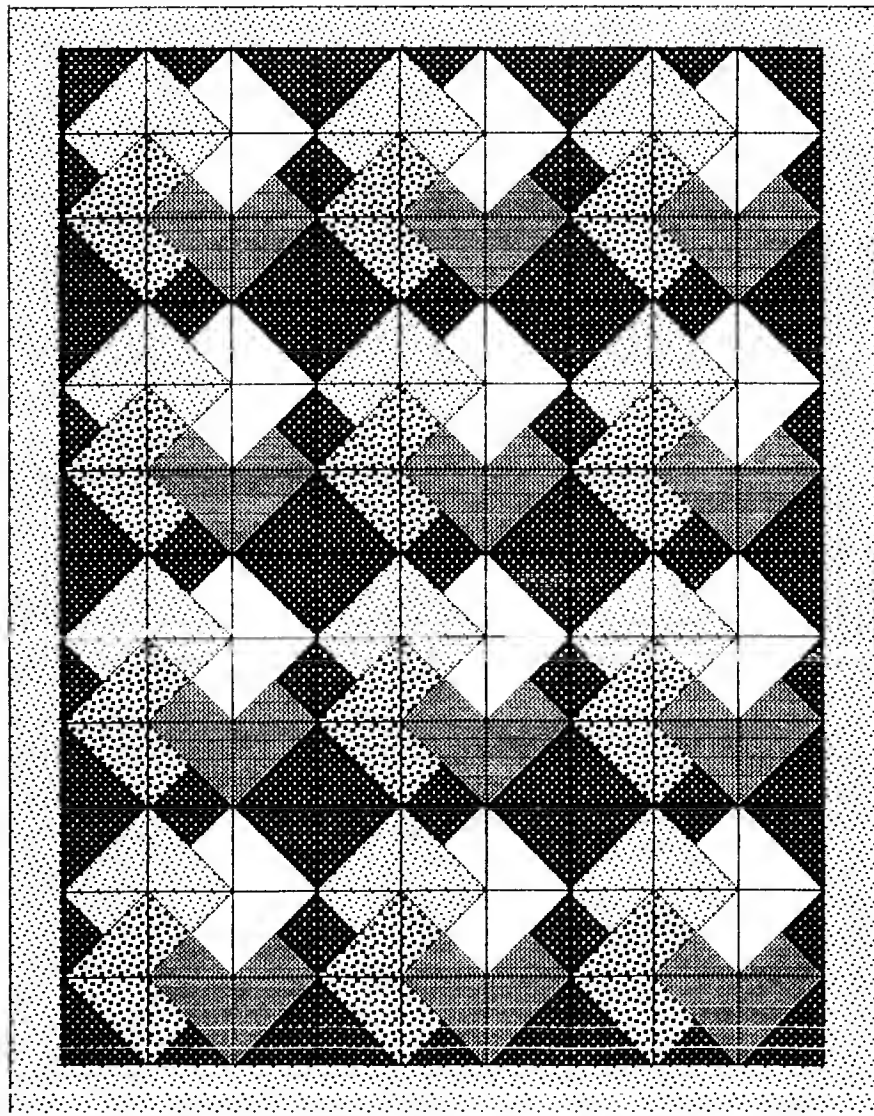
Before moving on to Chapter 4, let's have some fun with quilting patterns. When quiltmakers design quilts, they take into consideration repetition of colors and patterns. Quilt design is based on pattern blocks that are repeated. Figure 3.22 shows you some common, basic pattern blocks used in quilting. Combining pattern blocks into a quilt creates a much larger and striking quilt pattern. Changing the color in the same pattern block can create very different overall results. Figure 3.23 A-C shows the development of a pattern block. Create a pattern block of your own. Then using **LASSO**, copy the pattern block several times. Fill each one differently with **PATTERN** and **PAINTBUCKET**. Again using **LASSO**, use one of the painted pattern blocks to create a quilt as shown in Figures 3.24-3.28. Create a quilt with the second painted pattern block. Whether you are a quiltmaker or not, I hope you find this as entertaining as I did. If you are not a quiltmaker, and don't know one that you could design quilts for, maybe you know a kitemaker!



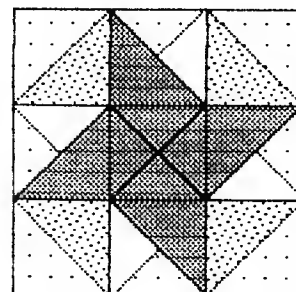
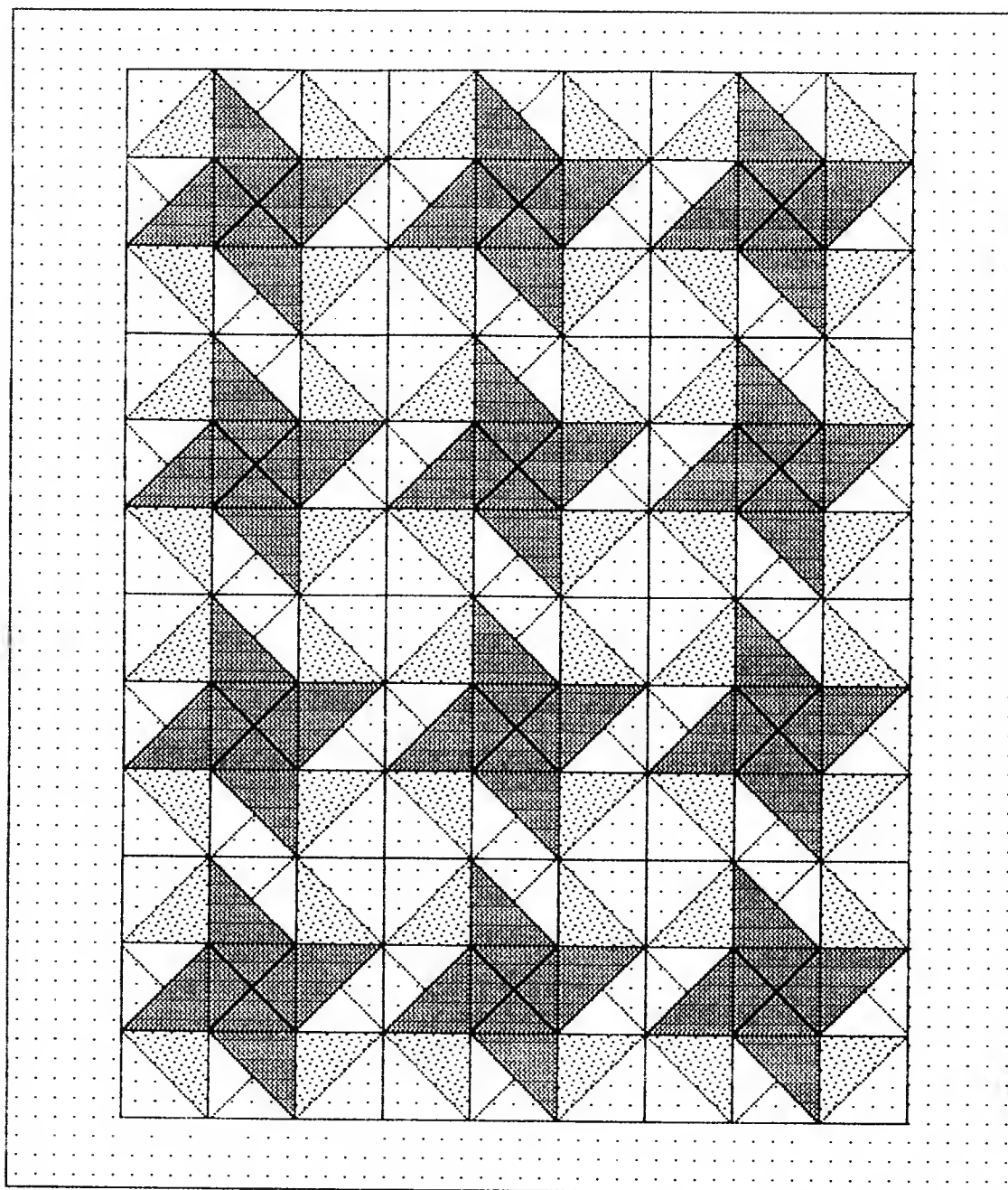
**FIGURE 3.22.** Basic design types for quilting block patterns.



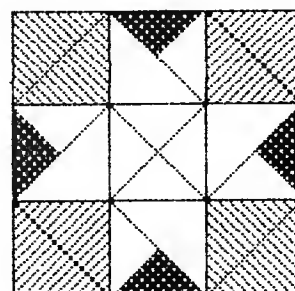
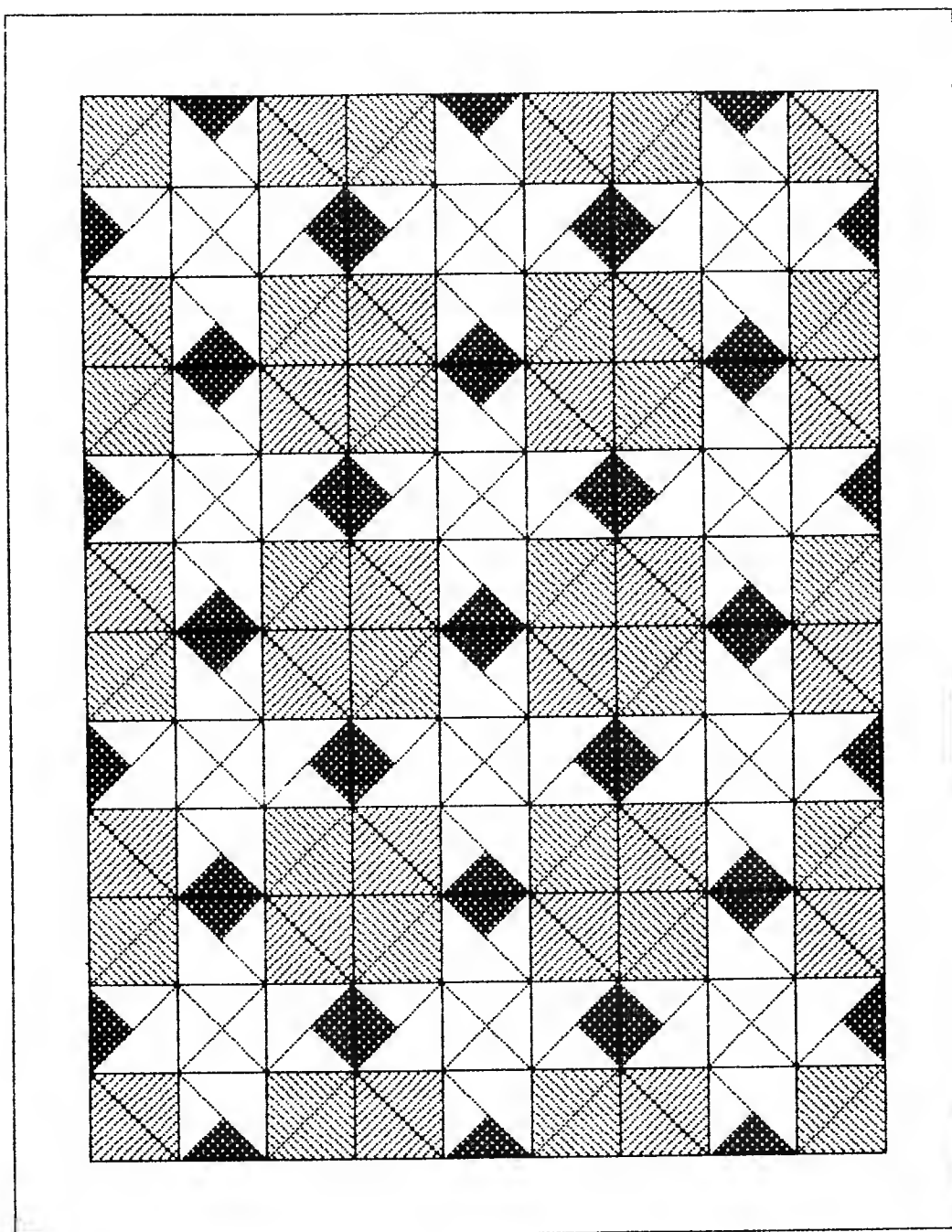
**FIGURE 3.23 A-C.** *Developing a block pattern for quilting. In step B, MARQUEE three squares, add diagonal lines, then ROTATE and fill the remaining six squares in the block pattern.*



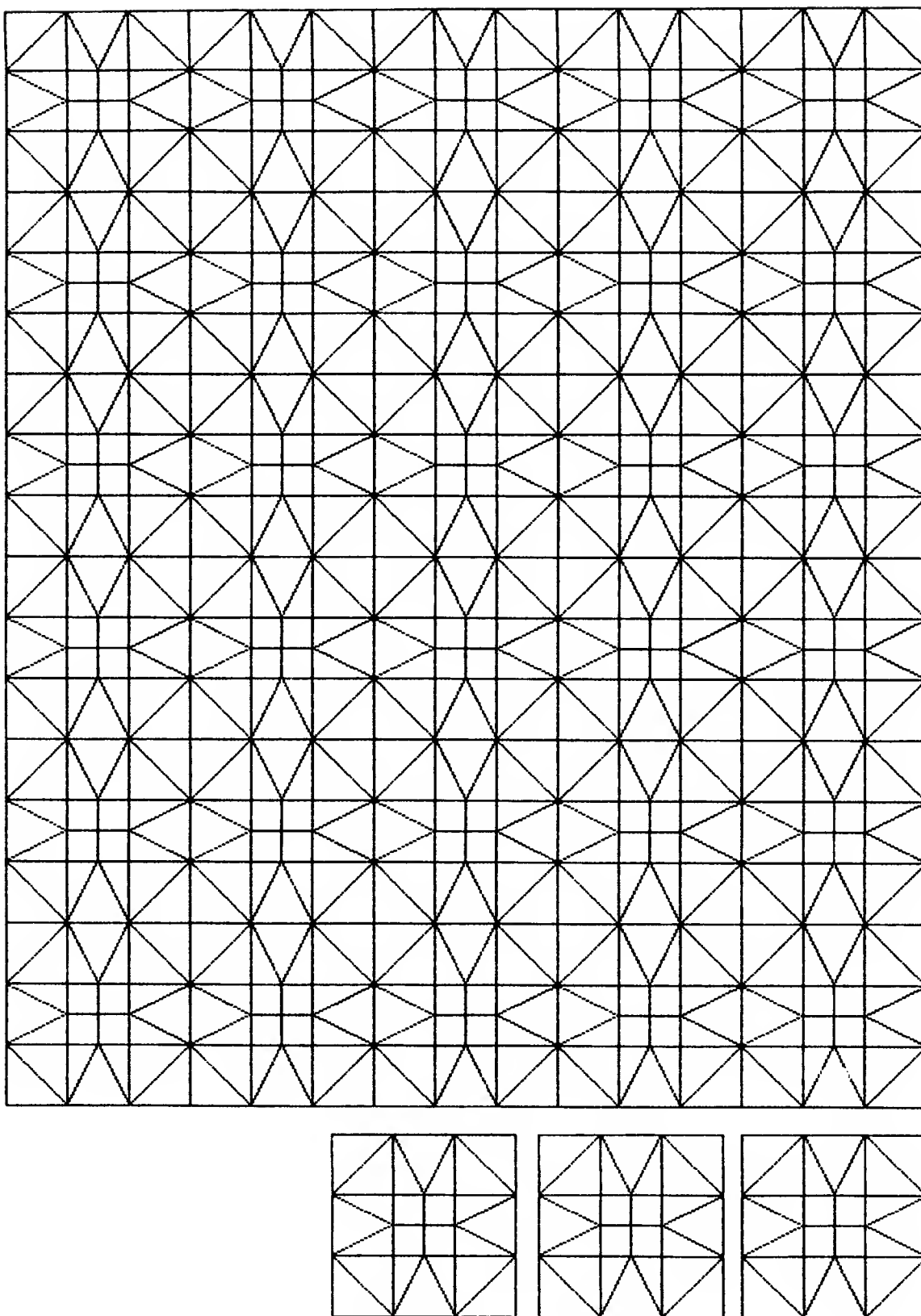
**FIGURE 3.24.** Four block patterns filled. One block was used to create *Quilt #1* by using the **LASSO** and the **OPTION** and **SHIFT** keys.



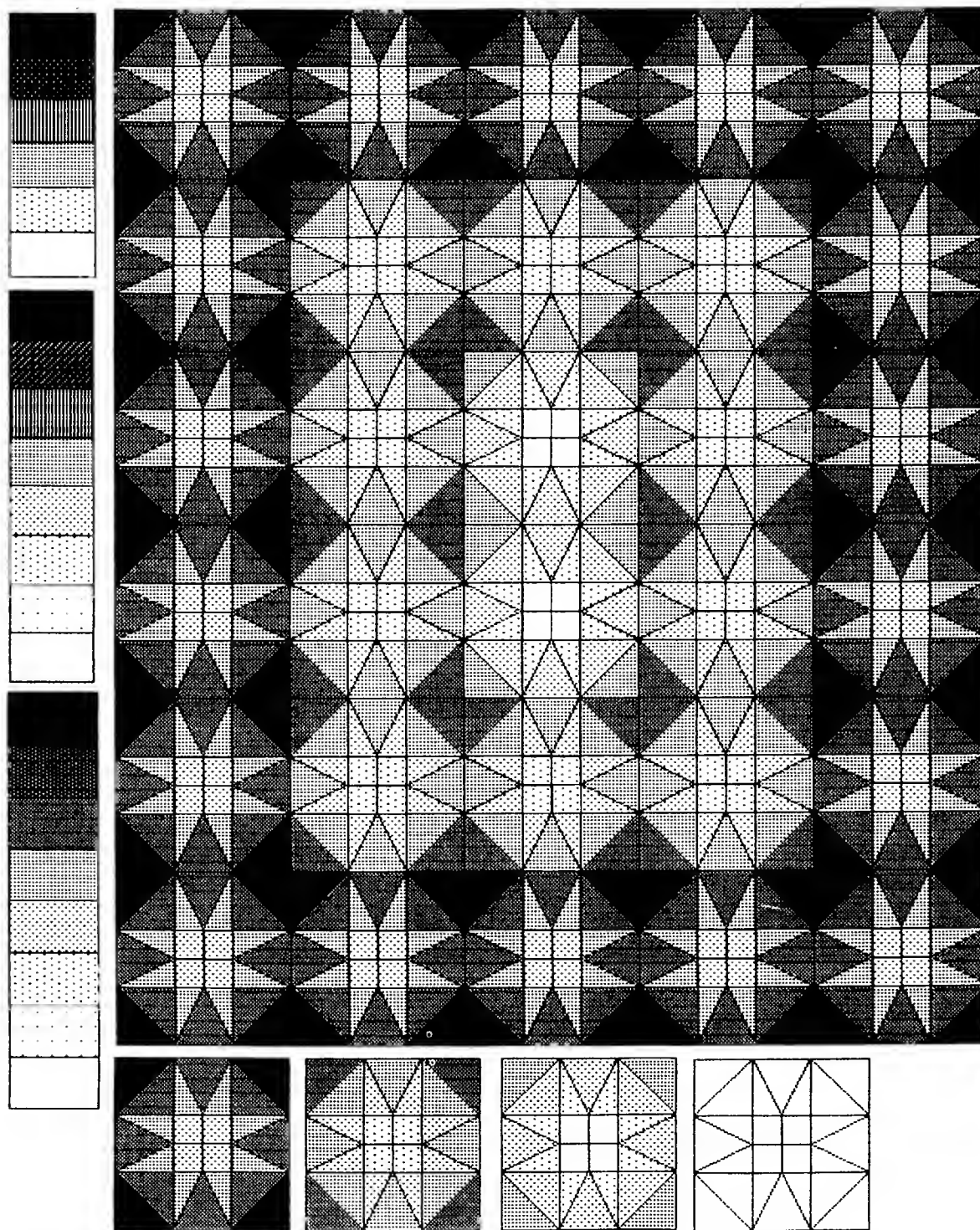
**FIGURE 3.25.** Quilt #2.



**FIGURE 3.26.** Quilt #5.



**FIGURE 3.27.** *Unpainted quilt with unpainted blocks.*



**FIGURE 3.28.** *Painted Quilt #4 with grey scales and three painted blocks. Development of good grey scales is important to subtle changes in this quilting pattern.*



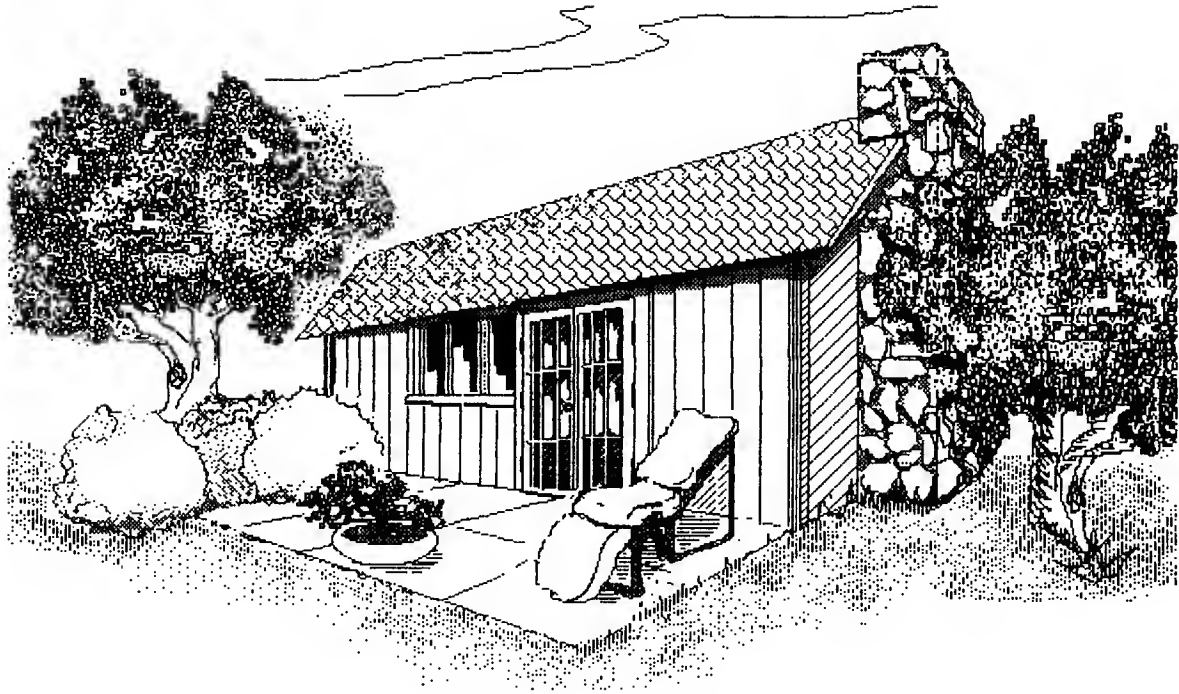
Documents filled with lines and patterns, as the quilts are, require a significant amount of diskette work space. The quilt in Figure 3.28 requires 90K available in MacPaint. See Appendix B for full explanation and tips on diskette storage.



This concludes our discussion of Chapter 3. The next series of drawings are samples that might be produced in a design office, especially in early conceptual design development. The drawings focus on the development of a cottage design studio in a rural area. Shaded portions of the Flowchart indicate the stage of design represented by the next drawings.



## Chapter 4 Technical Drawing With MacPaint



Chapter 4 focuses on technical drawings used for small design projects in the home or professional design office. Although the drawing examples are oriented toward conceptual site and interior design of a cottage studio, the MacPaint principles apply to many other drawings and design uses. The cottage design studio is the topic used to demonstrate MacPaint's potential applications.

Technical drawings presented are: (1) plan views looking down on the top of the site or building; (2) elevational views looking at an object face on without any indication of depth or distance; and, (3) perspectives viewing an object from an angle portraying depth, distance and spatial effects. The intent is not to teach you how to produce technically accurate drawings but to demonstrate the application of MacPaint. In each of these drawings there is discussion of a MacPaint tool that applies to any type of design drawing. *Site Inventory* demonstrates how to fit an entire drawing on a MacPaint page at a specific scale. *Site Analysis* continues with the same drawing as a base map and shows how to create a simple overlay map while the *Master Plan* introduces illustrative graphic details. Since floor plans are so frequently used, a *Floor Plan* is presented which also guides the layout of the *South Elevation*, an exterior view of the cottage. Presented last are perspectives of the cottage studio's interior and exterior.

So let's begin with scale and the *Site Inventory* drawing.

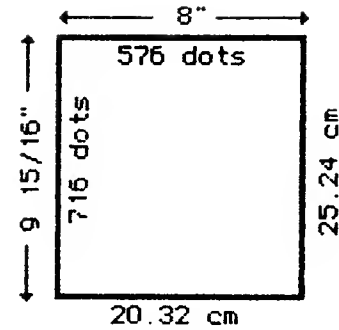
## ***Scale***

Before drawing any map or scaled technical drawing, the first question is how to determine the scale of the drawing so that all the information fits on the page consistently?

Most architecture and engineering drawings are "drawn to scale". There is ratio between the size of the drawn object and the size of the real object. For example, house plans in the United States are frequently drawn to 1/4" scale. One-quarter inch on the drawing equals one foot on the house. If a room measures 2 1/2" x 3" on a drawing, you would expect to find the actual room dimensions to be 10' x 12'. U.S. manufacturing drawings are frequently scaled to 1" = 1'. Any scale is possible: the scale for a drawing is determined by page size and resolution required.

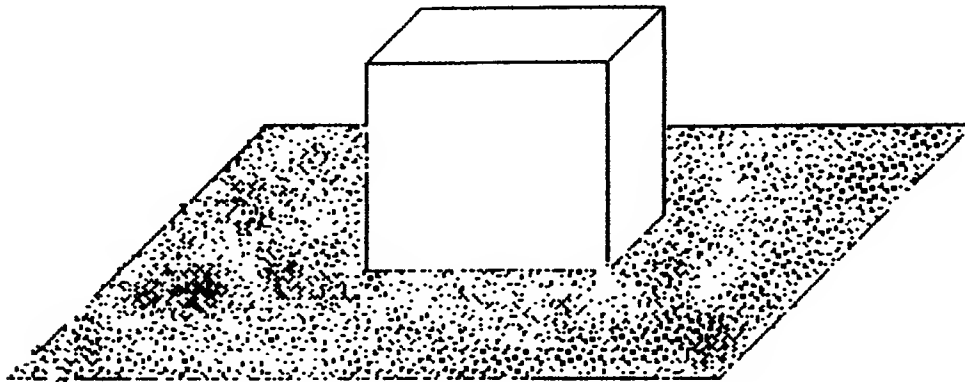
Whenever possible, scaled drawings are produced on grids which are based on 1/4", 1/8", or 1/10" (6 mm, 3 mm, or 2 mm) squares. Creating scaled drawings on a grid is easier and faster than creating the drawing on ungridded paper. Techniques used to produce MacPaint drawings to scale differ slightly from the techniques traditionally used by architects and engineers, but the basics are the same. We are going to create a grid based on a square sized by number of dots rather than inches or millimeters. In the MacPaint environment this dotted square grid system will allow drawings to be produced quickly and easily to scale.

The maximum drawing space on an Imagewriter printed page is 8" x 9-15/16", or 20.32 cm x 25.24 cm (centimeters). The printed drawing is constructed of individual dots in which 1 inch has 72 dots or 1 cm has about 28 dots. Maximum drawing space on an Imagewriter page is 576 x 716 dots. Note that we have been discussing the size of the printed drawing. Dimensions of the drawing displayed on the screen are slightly less.

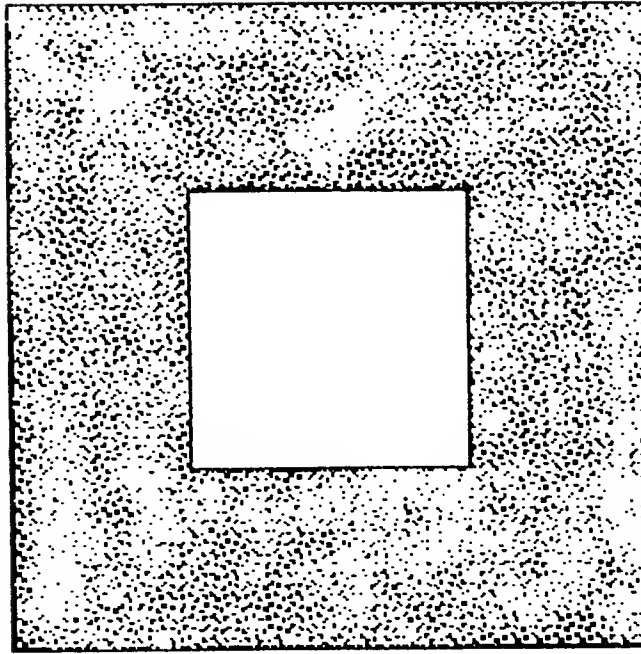


**FIGURE 4.1.** Printed page size.

Let's begin with a large cube sitting on your lawn. The cube is 18 feet (5.50 meters) on each side and centered in a lawn which is 50 feet (15.24 meters) on a side. Figure 4.2 should give you the idea of this strange lawn with its cube. Now, we want to put this lawn and its cube on paper drawn to scale. Since scale is complex enough, let's try to keep the drawing on one window screen. This is approximately 5-3/4" x 3-1/4" (14.8 cm x 8.4 cm) of paper. When viewing the cube and lawn from the top as a bird flies over, we would see a square within a square, or a very simple plan view (Figure 4.3). So, we are going to fit 50' or 15.24 meters onto 3-1/4" (8.4 cm) of paper.



**FIGURE 4.2.** Cube on a square lawn.



**FIGURE 4.3.** *Plan view or looking down on the cube on a lawn.*

The first step is to determine the number of dots available across the length and width of available paper space—5-3/4" x 3-1/4" (14.8 cm x 8.4 cm). Remember we are trying to convert measurements from the real world of feet, inches, meters, and centimeters to a MacPaint world of dots.

**(available distance on paper) \* (number of dots per unit on paper) = available dots**

**(3-1/4") \* 72 dots per inch = 234 dots**  
**8.4 cm \* 28 dots per centimeter = 235 dots**

Next, we want to find the number of dots needed to represent one foot or one meter.

**available dots / distance to be represented = number of dots per unit**

**234 dots/50 feet = 4.68 dots/foot**  
**235 dots/15.24 meters = 15.42 dots/meter**

Since dots cannot be divided in MacPaint, whole numbers of dots must represent a foot or a meter, five dots per foot or 15 dots per meter. If we create a grid based on five or 15 dots, drawing our plan view of a cube on the lawn would be a snap. But what does a five-dot or 15-dot line mean? Let's look for a moment at the grid patterns in the PATTERN palette. Figures 4.4 and 4.5 show you grid patterns as they look normally on the screen and in FATBITS. Notice the five-dot grid system. This one is a good source of eyestrain if you have to count squares for a long time. The five-dot grid and the nine-dot grid are the standard patterns from the PATTERN palette. The 12 or 15 dot grid systems are begun in FATBITS.

You want a grid system that is comfortable for you to draw on and still represents convenient measurements. One last thing you should notice about the grid patterns is that although there may be nine dots to a square's side, each square shares a dot with the next square. So, if you have ten squares each nine dots wide, you have 81 dots total, not 90 dots.

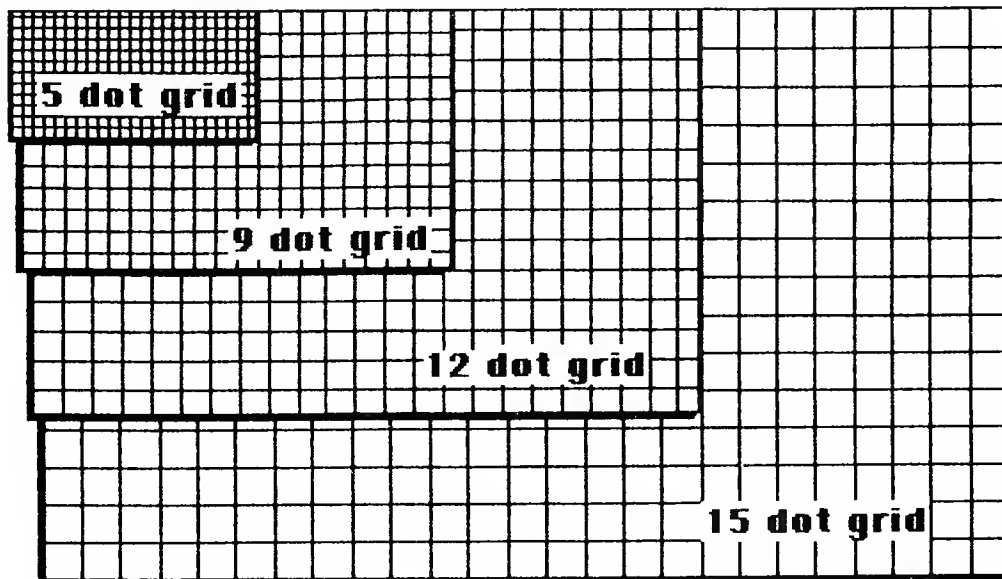


FIGURE 4.4. Grids from the *PATTERN* palette are five-dot and nine-dot.

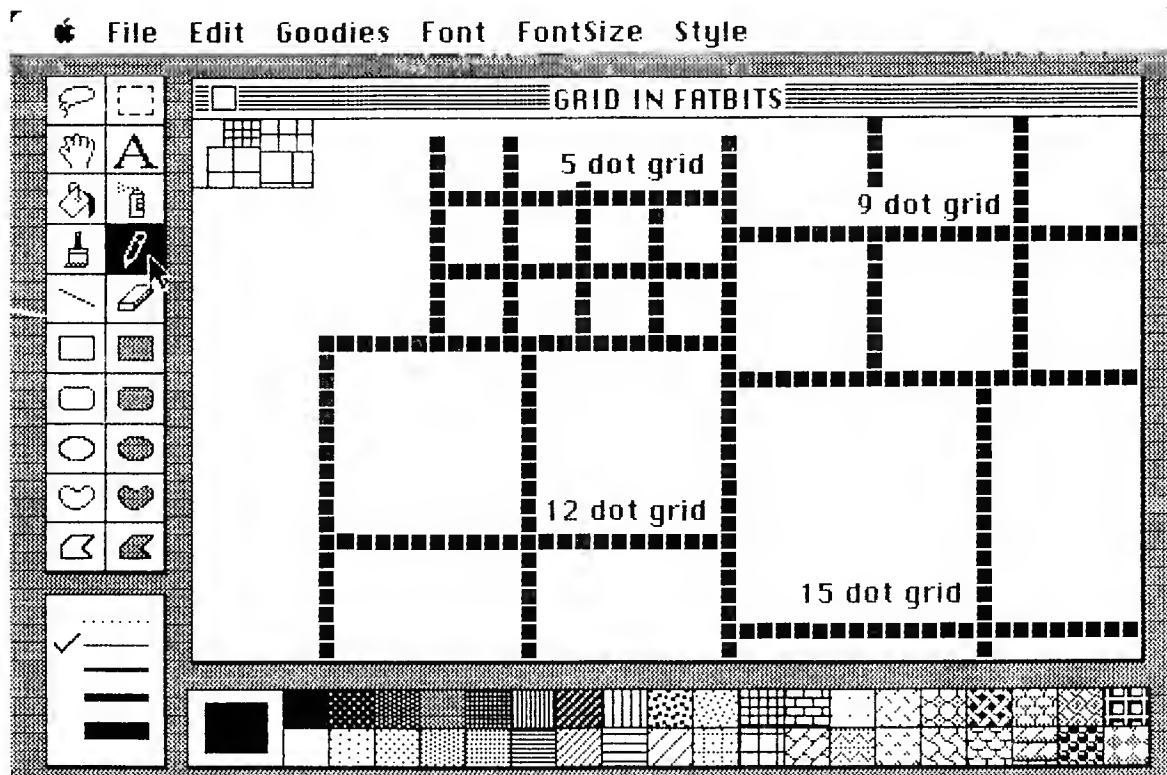


FIGURE 4.5. Grid sizes shown in *FATBITS*.

**(number of squares \* (number of dots on side of square - 1)) + 1 = number of dots across a grid system**

**(10 squares \* (9 dots side of square - 1 dot)) + 1 dot = 81 dots**

Your first temptation might be to use the standard nine-dot grid PATTERN that is already available to you and let it represent two feet rather than using the five-dot grid as one foot. To determine if a nine-dot grid can represent two feet and still fit on the drawing, we first multiply eight dots (each square shares a dot) by 25 squares and add a dot.

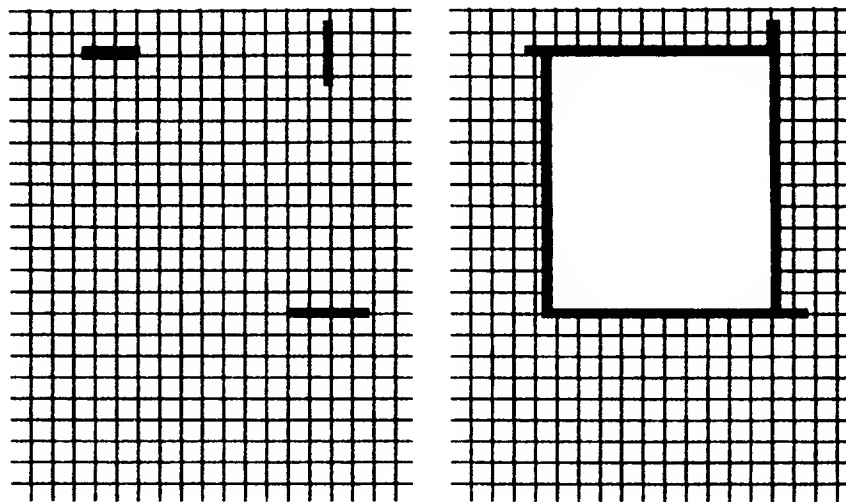
**((dots/square)-1 dot) \* (total distance to be represented/distance one square represents) + one dot = total dots needed**

**(8 dots/square) \* (50 feet/2 foot/square) + one dot = 201 dots**

**(14 dots/square) \* (15.24 meters/1 meter/square) + one dot = 214 dots**

Since 201 and 214 dots are within the range of the 234 dot-window, we will be able to complete the drawing on one window. Although the standard large grid PATTERN from the PATTERN palette can be used for the nine-dot grid to equal two feet, we will have to create a grid for the 15-dot grid system.

1. Using **FATBITS** create a 15-dot grid, then duplicate it carefully across the screen with **LASSO** and the **SHIFT** and **OPTION** keys.
2. Since each square represents one foot, count fifty squares, marking the first and last squares with a heavy paint brush (Figure 4.6). If you are working on the nine-dot grid, count 25 squares since each square represents two feet.



**FIGURE 4.6.** Use tick marks to locate shapes on a grid.

3. Using the FILLED RECTANGLE, draw in the cube in plan view on the marked grid.
4. Add labels to your drawing that include dimensions.

This approach to calculating the scale of drawings is the same approach used in Site Inventory. The only difference is that Site Inventory is larger and has more squares and circles on it (Figure 4.7). Site Inventory began as a hand

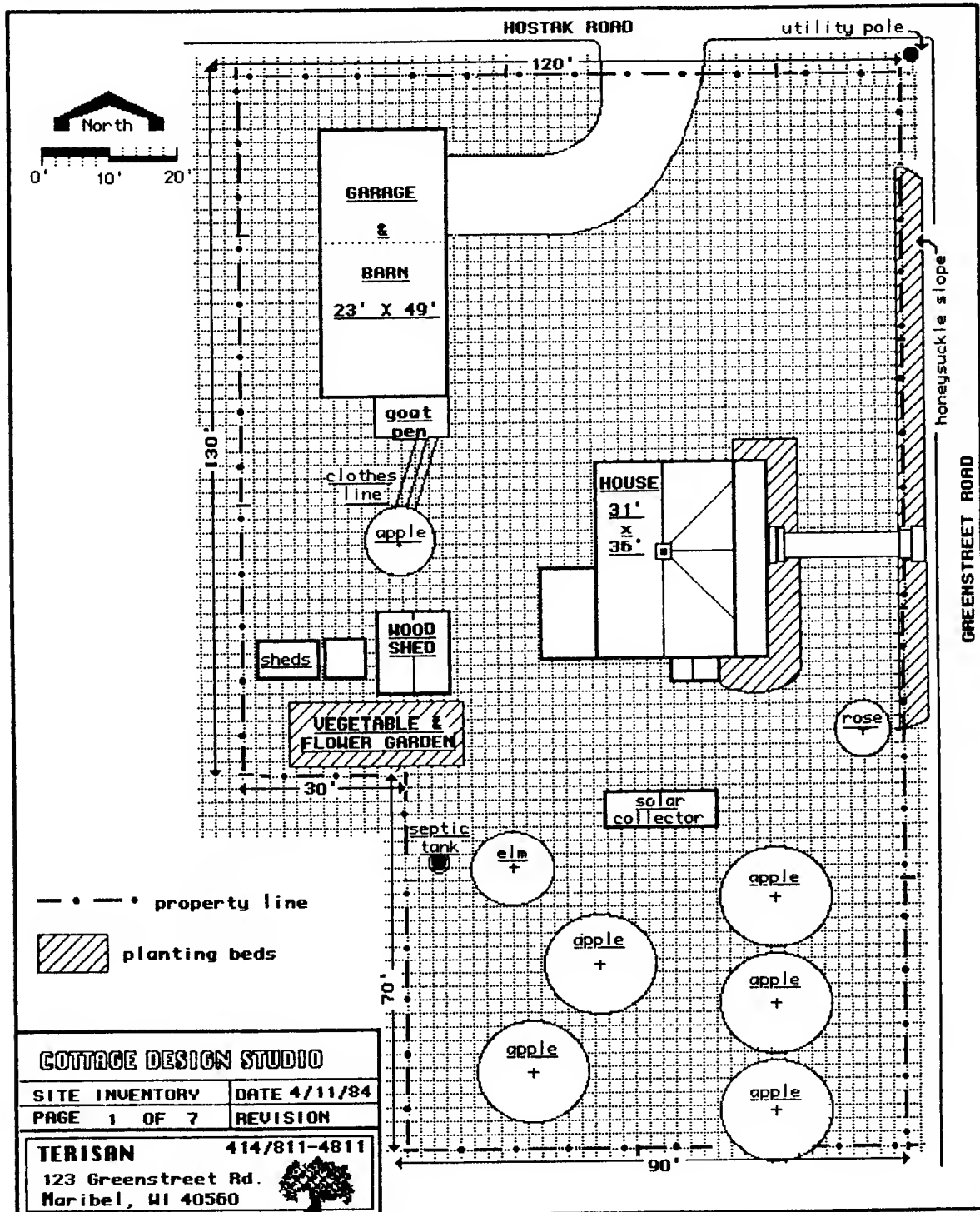


FIGURE 4.7. Site Inventory map.

drawn map that showed dimensions and locations of major trees and buildings. The hand drawn map indicated the widest and longest dimensions to be 120' x 200' (36.4 meters x 61.2 meters). Let's assume then, that 200' (61.2 m) must fit onto 9 1/2" (24.13 centimeters) of paper.

**(available distance on paper) \* (number of dots per unit on paper) = available dots**

**9.5 inches \* 72 dots per inch = 684 dots**

**24.13 centimeters \* 28 dots per centimeter = 676 dots**

**available dots / distance to be represented = number of dots per unit**

**684 dots / 200 feet = 3.4 dots per foot**

**676 dots / 61.2 meters = 11.1 dots per meter**

Eight-dot or nine-dot grid squares are the minimum size for practical use as mapping units. Consequently, I prefer creating a grid based on an eight- or nine-dot square and letting it arbitrarily represent two feet or two-and-one-half feet rather than using a four-dot grid system in which one square equals one foot. In the metric system, the eleven-dot or twelve-dot grid is very comfortable to work with. A fifteen-dot grid works out nicely to be .5 centimeter on paper. This would be a good representation of one meter. However, in this example, 61.2 meters would require 30.6 centimeters of paper.

Since three- and four-dot squares are too small to work with as grid squares, let's assume that a nine-dot square would be convenient to represent two-and-one-half feet. This allows us to use the grid from the PATTERN palette.

If you recall, the objective set initially was to fit the drawing on 9 1/2 inches or 24.13 centimeters.

**total distance to be represented on drawing / distance one square represents on grid = number of grid squares needed to represent the distance**

**200 feet / 2.5 feet per square = 80 squares**

**61.2 meters / 1 meter per square = 61.2 squares**

To find exactly what the distance on paper will be:

**(number of squares \* (dots per square -1)) + 1 dot = total dots**

**(80 squares \* 8 dots) + 1 dot = 641 dots**

**(61.2 squares \* 11 dots) + 1 dot = 674 dots**

**total dots / dots per unit of measure = total distance needed on paper**

**641 dots / 72 dots per inch = 8.9 inches**

**674 dots / 28.3 dots per centimeter = 23.8 centimeters**



As the calculations indicate, if a nine-dot square grid system represents two-and-one-half feet to the square, almost 9 inches of paper will be required. This is well within the 9 1/2 inch established limit. Similarly, a twelve-dot square grid system fits onto 23.8 centimeters, also within the limits. If you are using the nine-dot grid, take PAINT BUCKET or MARQUEE and FILL from the EDIT menu and cover the drawing document with the grid PATTERN.

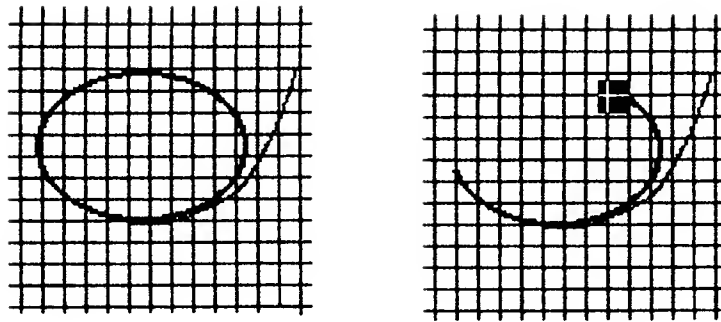
When grids from the PATTERN palette are not suitable, it is easiest to begin a new grid using FATBITS. After the first four or five adjacent squares are complete, press the OPTION key and hold it down. As long as you hold down the OPTION key, you can use the SCROLL icon to move the FATBITS screen to a new area. You can continue to develop the grid in FATBITS using the SHIFT key to easily draw the straight lines. Or you can return to the full screen and rapidly add to the grid using the LASSO along with the OPTION key to add piece after piece of grid.

Once the grid in *Site Inventory* is in place, measurements from a hand-drawn map which located existing features of the land can be transferred from paper to MacPaint and onto your grid. From this point on, there are many ways you can proceed with the drawing. As you become more familiar with MacPaint, you will find your own preferred method. Art and design are creative processes that have no one single methodology once you understand your tools thoroughly. Consequently, many of the discussions in Chapter 4 present procedures which were used to create the drawings rather than telling you how to create the drawing as in previous chapters.

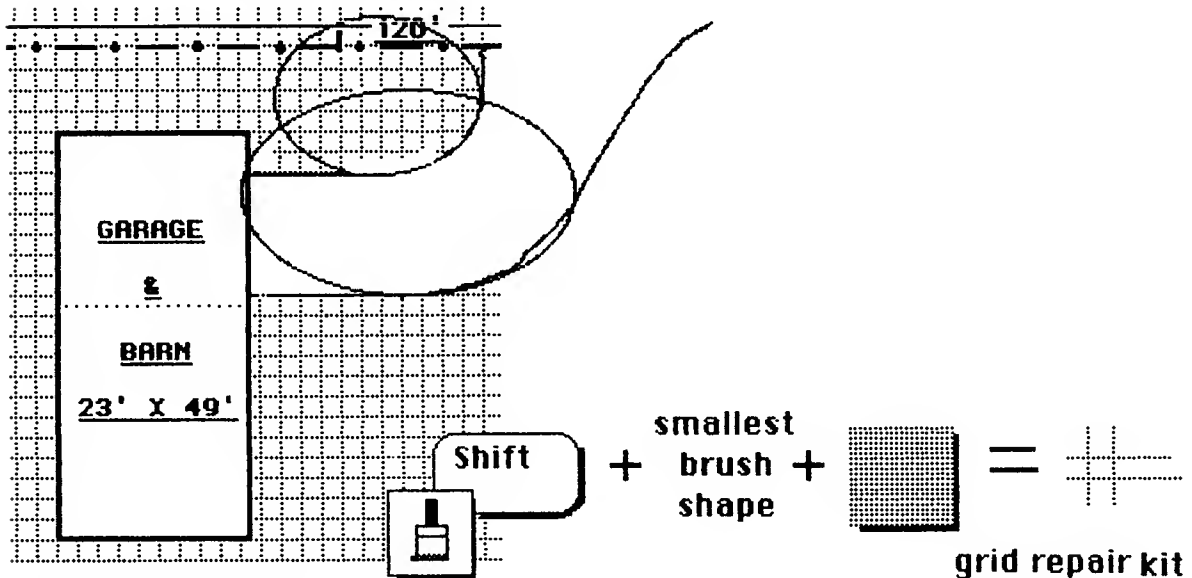
The property boundary was the first item placed on the grid since it was a reference point for locating buildings, trees, and driveway. Using heavy STRAIGHT EDGE or PAINTBRUSH and counting grid squares, tick marks were appropriately placed on the grid indicating boundaries of buildings. Using the white FILLED RECTANGLE for buildings and the white FILLED OVAL for trees, objects were placed on the grid according to the tick marks (Figure 4.6).

The driveway was first drawn using PENCIL. To smooth out driveway curves, parts of HOLLOW OVALS were fitted in to replace the jagged curves of the PENCIL. When the ovals were in place, the old jagged pencil line was removed using FATBITS.

Removing unwanted oval lines over an existing pattern can be accomplished using FATBITS or the largest PAINTBRUSH SHAPE with the PATTERN (Figure 4.8). To replace the dotted grid pattern used in *Site Inventory*, the PAINTBRUSH, the SHIFT key and the fine dotted PATTERN were used together and lined up with existing grid lines to replace the missing dotted grid (Figure 4.9). The STRAIGHT EDGE and OPTION key can be used in place of the PAINTBRUSH.



**FIGURE 4.8 A-B.** *OVALS were used as guidelines for curves (A). The grid was replaced using a large PAINTBRUSH and the grid PATTERN (B).*

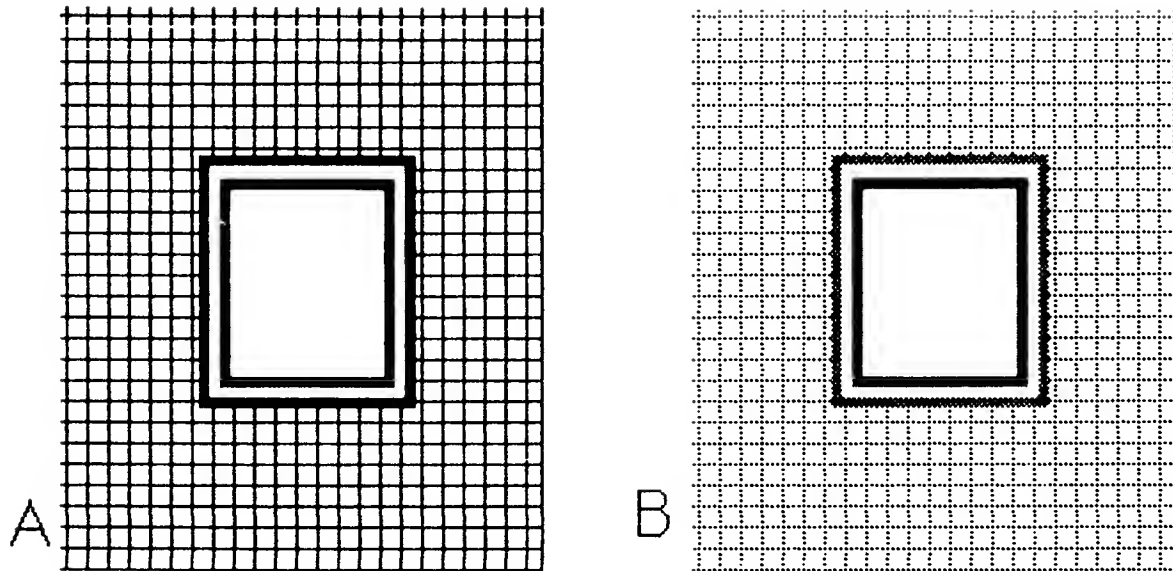


**FIGURE 4.9.** *The narrowest STRAIGHT EDGE and OPTION key can also be used with the fine, dot PATTERN to repair the grid.*

Creative repair methods such as these take the fear away from using temporary guides and later erasing them.

Last, objects were labeled using ALIGN MIDDLE, 9 POINT, PLAIN, UNDERLINED MONACO, and 12 POINT, BOLD, UNDERLINED CHICAGO.

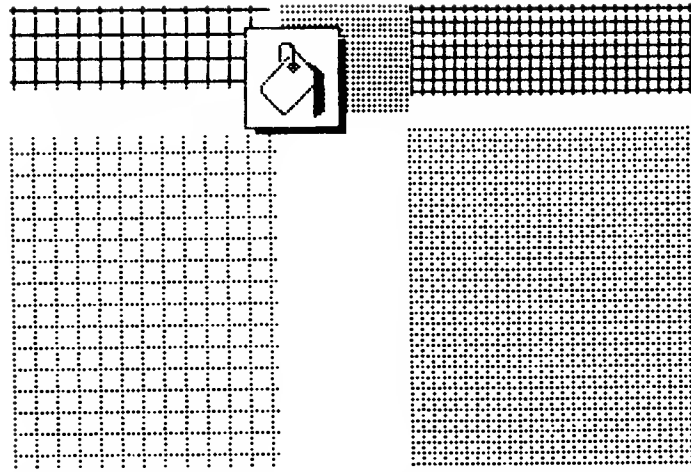
Notice that the grid in Site Inventory is dotted, appearing light gray as opposed to a solid black grid system. This was accomplished by touching the PAINT BUCKET and the fine, dotted PATTERN to a solid grid line system before anything else was placed on the grid. Try creating different variations of a dotted drawing now.



**FIGURE 4.10 A-B.** Dotted *PATTERN* will flow from the *PAINT BUCKET* until there is a break in the solid black line.

1. Fill one half of the screen with the large grid *PATTERN*.
2. Change to the fine, dotted grey *PATTERN* and apply *PATTERN* to the grid with the *PAINTBUCKET*—be sure the first drop of paint spilling from the bucket is what touches the grid.
3. Add a white *FILLED RECTANGLE* to the dotted grid.
4. Fill the second half of the screen with the large grid *PATTERN* and do the above procedures again, but perform step 3 before step 2.
5. Select *UNDO* so that the second grid and rectangle is solid black again.
6. Add another wide bordered rectangle inside the first rectangle but not touching the first rectangle.
7. Apply the fine dotted *PATTERN* to the grid again as in step 2.

This exercise should point out that when you apply the dotted *PATTERN* in this manner, the dotted paint will spill down black avenues of solid line until there is a complete break in the line. Softening the grid with dots makes the grid less conspicuous and the objects on the grid stand out better, a technique you will find useful when displaying various levels of information. The *PAINT BUCKET* and *PATTERN* applied to solid black lines is also a good way to begin overlay mapping as we shall see in *Site Analysis*.



**FIGURE 4.11.** *Results of pouring dotted PATTERN onto each grid PATTERN. The first drop of paint from the PAINT BUCKET must touch the grid line.*

## ***Overlay Mapping***

The next stage of the design process, analysis, uses the Site Inventory map as a base map to which information is added. If the base map remains in dark, solid lines, added information results in illegibility or confusion. A base map that gives reference to new information, as in Site Analysis, must be visible but de-emphasized. New information added to the base map must be bold and as easy to read as possible. Overlay mapping uses this approach to display information in a hierarchy of importance.

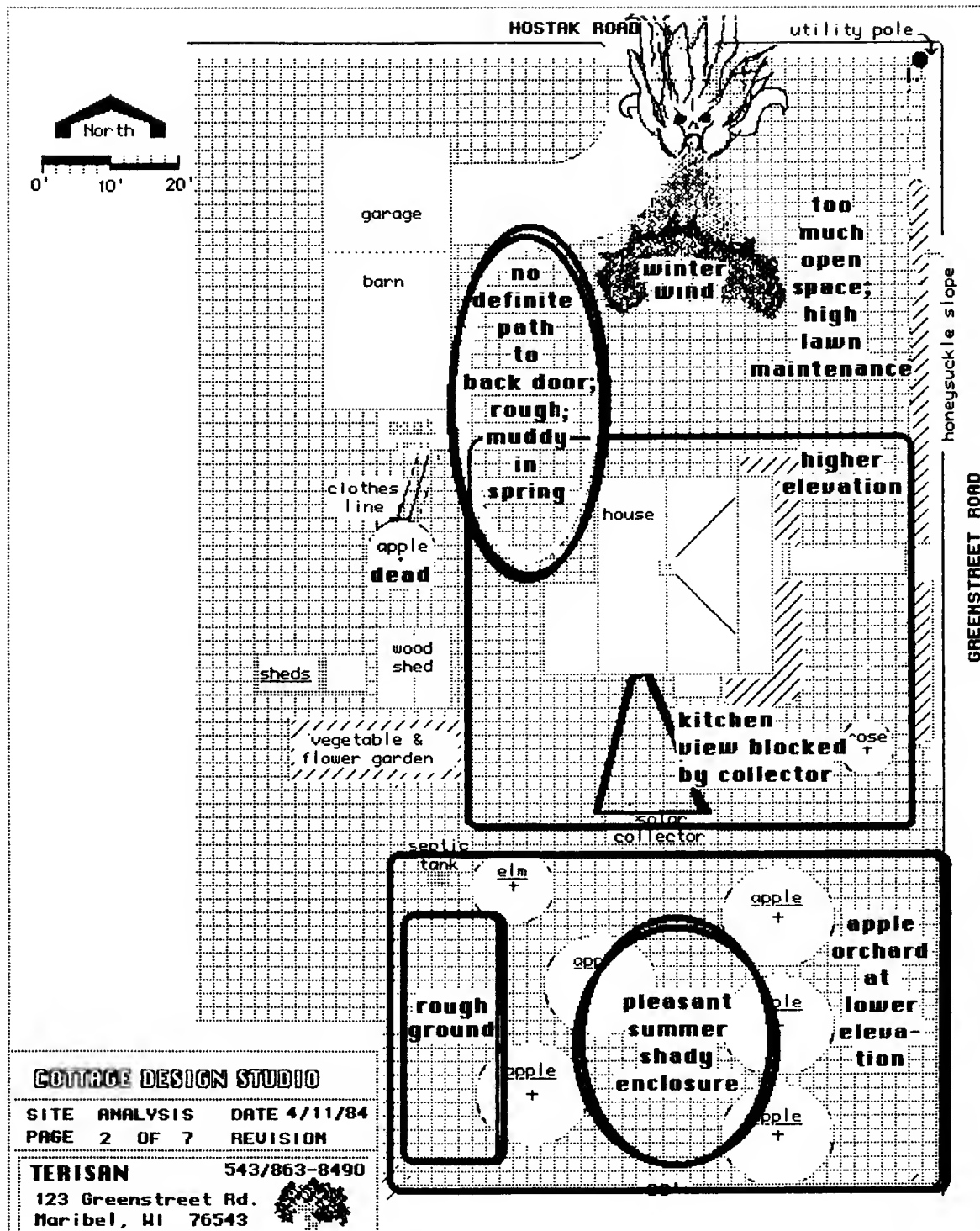
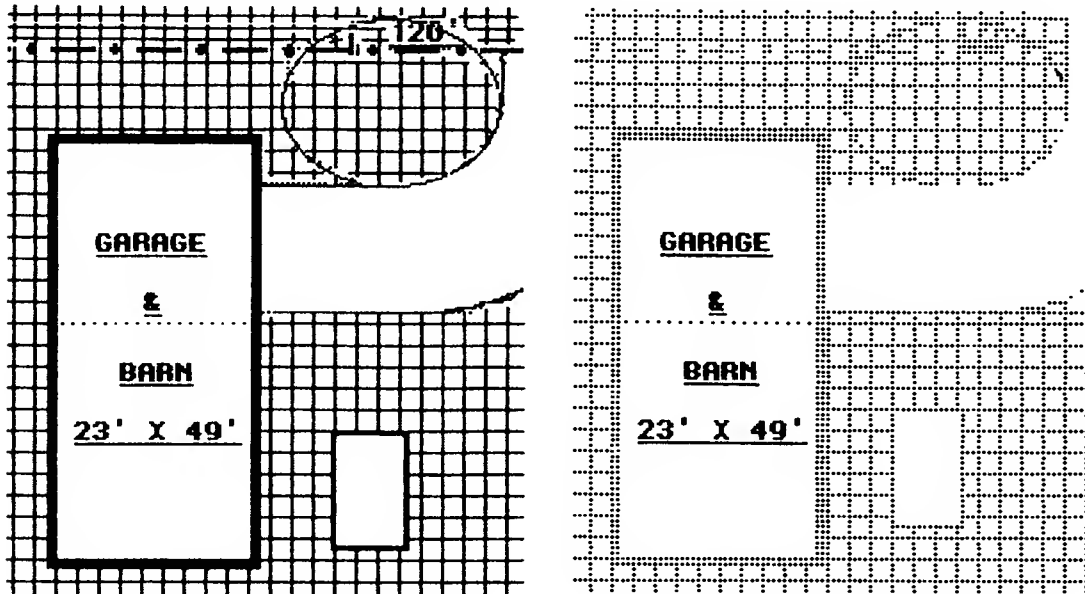


FIGURE 4.12. Site Analysis map.

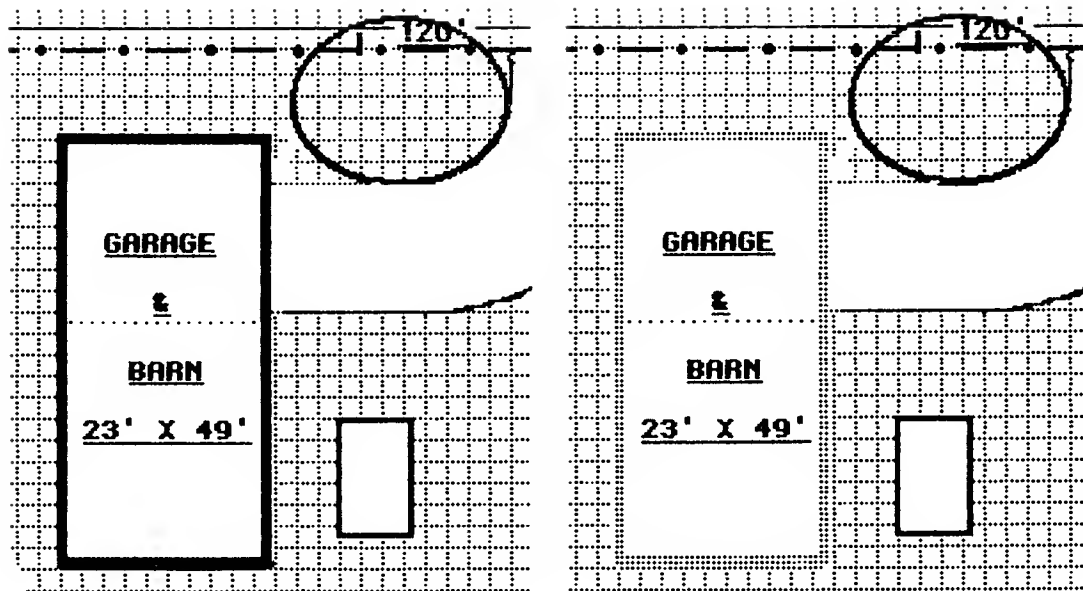
Site Analysis uses the Site Inventory map as its base (Figure 4.12). In Site Inventory the size and shape of the site's trees and buildings was important information. However, in Site Analysis, size and shape of trees and buildings is not as important as their impact on the site. The trees and buildings need to be de-emphasized so that additional pertinent information will clearly stand out yet relate to the physical features of the site.

There are two approaches to creating a light gray base map used in displaying and de-emphasizing lower levels of information. One approach is to leave the grid system and its subject matter in solid black lines until the entire drawing is finished. In the final step of the drawing, applying PAINT BUCKET and fine dotted PATTERN to the grid system changes the grid and anything in contact with the grid to the fine dotted PATTERN. Since everything except some lettering and minor details touches the grid, the entire drawing turns to dotted lines. The dotted lines give the drawing a light gray or muted appearance (Figure 4.13). You experimented with this idea previously.



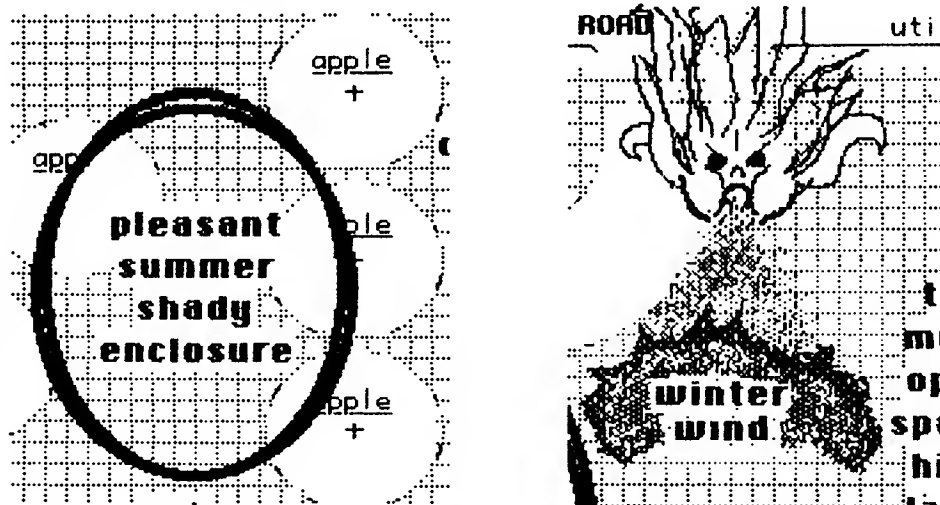
**FIGURE 4.13.** Results of dotted PATTERN and PAINT BUCKET applied after drawing is complete.

In the second approach, used in *Site Inventory*, the grid was lightened before adding more drawing information. As was mentioned earlier, this emphasizes newly added images drawn in solid black line on the light, dotted grid. The disadvantage is that once the grid has been changed from solid black to a dotted grey, the process cannot be easily reversed. However, if you are using one of the standard grids from the PATTERN palette, the largest PAINTBRUSH can be used to repaint the grid in solid black. The PAINTBUCKET's fine dotted PATTERN must spill down solid black lines like paint running down a corridor. If the black line corridor stops, so does the dotted paint. Alternatively, if there is no solid grid network for the paint to travel through it can not reach any isolated solid lines. Each solid-lined image displayed on the lightened grid must be painted individually with the PAINT BUCKET and the fine, dotted PATTERN to become part of the base map (Figure 4.14).



**FIGURE 4.14.** Since the grid was dotted before the buildings were added, each building must be hit with the **PAINT BUCKET** and dotted **PATTERN** to make the buildings a part of the base map.

The first step taken in creating the Site Analysis map was to lighten solid lined trees and buildings on the Site Inventory map. Bold lettering was also replaced with 9 POINT, PLAIN, MONACO text. Additional information that became part of the analysis map was added using heavier or bolder line weight than would normally have been used. HOLLOW OVALS, for example, were drawn with four-dot BORDER LINE WIDTH—the second heaviest line. BOLD text STYLE was also selected. Notice how the “winter wind” graphics does not stand out well since its creation used thin PENCIL and SPRAY PAINT. This type of image tends to become diffused and lost when overlaid on a gridded base map. This may be appropriate for wind but not for clear readable graphics (Figure 4.15).



**FIGURE 4.15.** Information added to a base map is best drawn in bold simple lines.

Once a base drawing is created it can be reused many times to present a hierarchy of information. Overlay mapping is useful in location drawings and construction work schedules as well as site analysis maps. Lightened base map drawings of a site or building plan can be used to overlay solid line electrical or piping diagrams. The emphasis is on the electrical or piping details while location, represented by the dotted base map, is secondary information. Drawings which show underground utilities are another application of overlay mapping. In this case, information above ground would be displayed by dotted lines and underground wiring or piping would be displayed as solid, heavier lines.

Overlay mapping of construction drawings can be used as work schedules. Work to be performed at a particular time would be highlighted in dark lines while the whole construction site or project would be in lighter, dotted lines. This gives those working from drawings a better perspective of how their current work relates to the entire project. Another aspect is to display unfinished work in dotted line and completed work in solid line.

There are many possible uses for displaying drawings or portions of drawings in dotted line. The PAINTBUCKET and the fine, dotted PATTERN together perform their best function as de-emphasizers in overlay maps and construction working drawings.



## Detailing

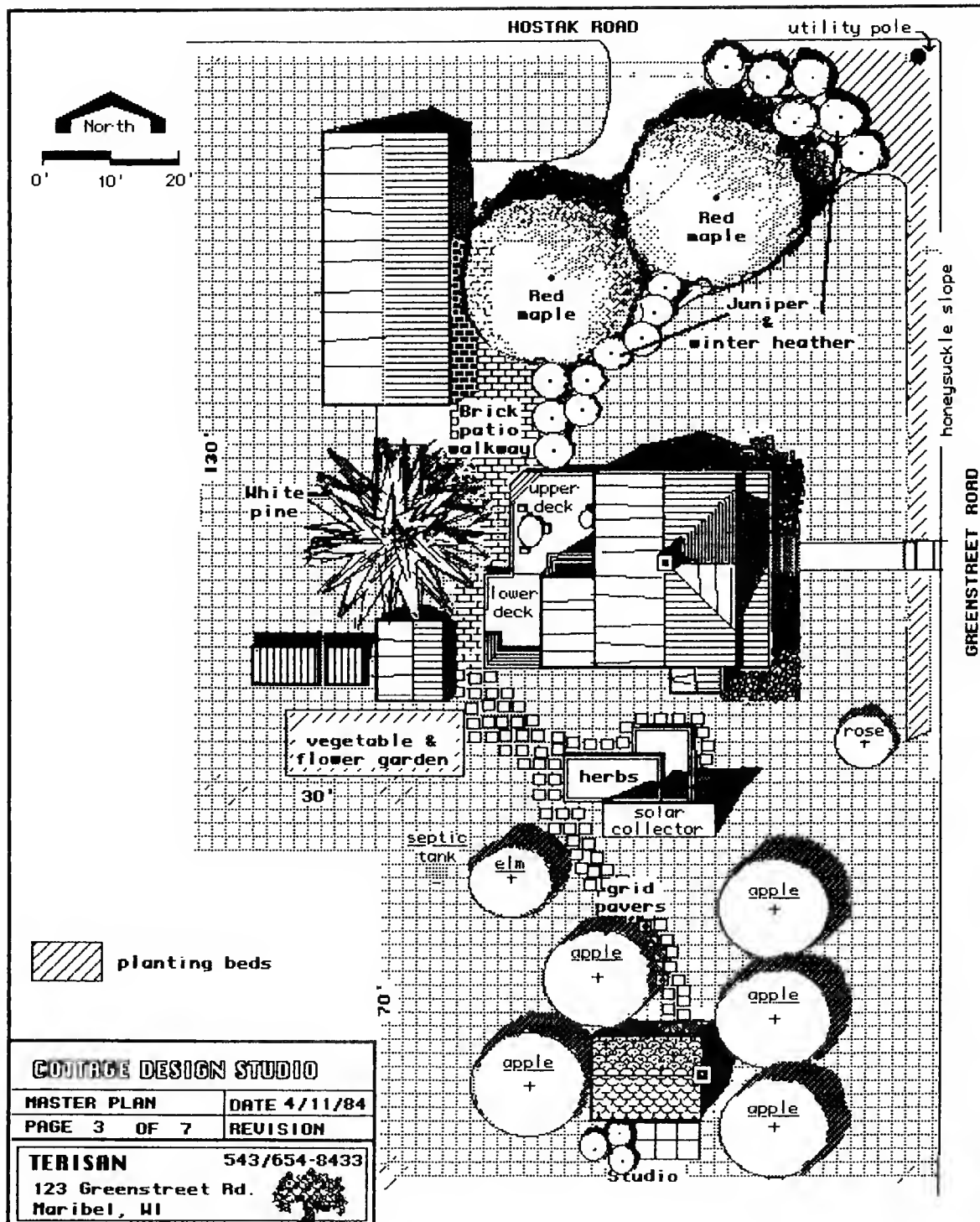
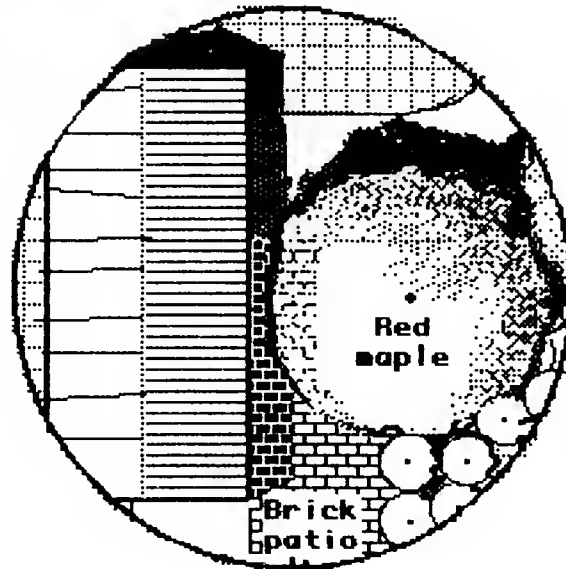


FIGURE 4.16. Master Plan.

The Master Plan map was created from the Site Inventory map in which the trees and buildings were solid lines on a dotted grid. A hand sketch of the landscape design was developed directly on a printout of the Site Inventory map. An alternative is to lay tracing paper over printed copies of Site Analysis or Site

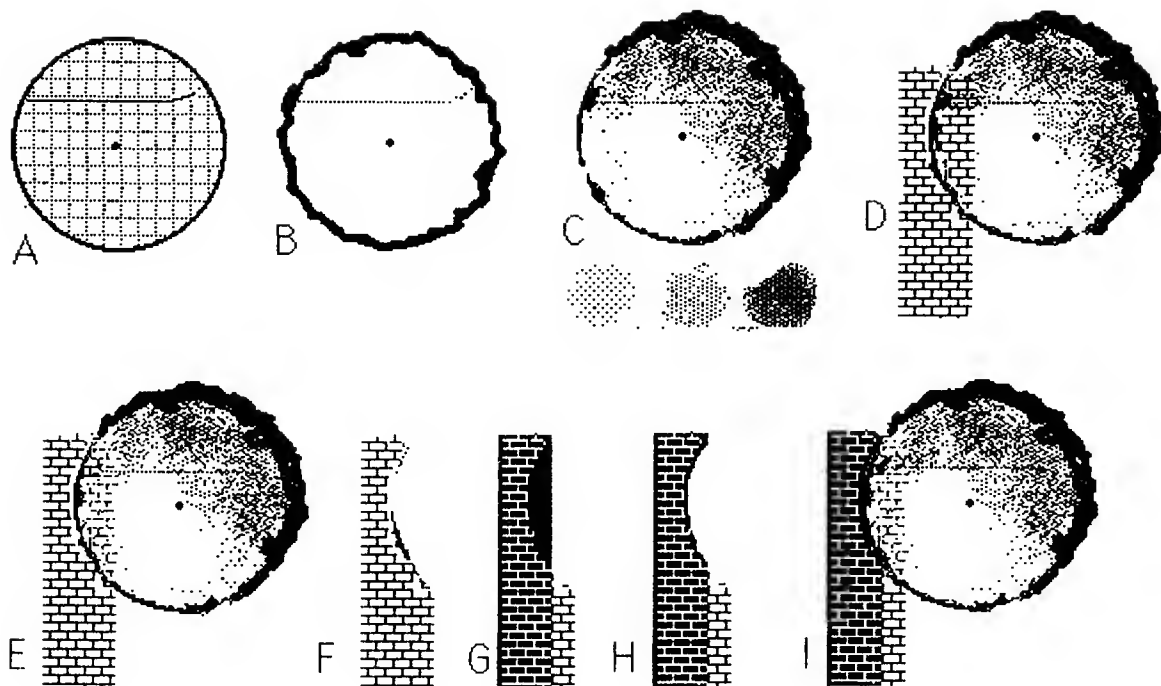
Inventory and develop the layout plans on tracing paper. Whichever you prefer, the initial design layout should be sketched on paper before it is drawn on the Macintosh screen.

One overall strategy in the *Master Plan's* development in MacPaint might be to develop the site from the ground up. This would be consistent with overlay drawing methods, since trees and shrubs cover details on the ground, and larger trees partially cover smaller trees. However, it can be difficult knowing exactly where to put the less important background or ground level details, such as the brick patio walkway, before the deck is laid out and attached to the house. Instead, the largest and most important components of the design were placed on the map first; red maples, cottage design studio, herb garden, and decks. Then details were added from the ground up; grid pavers, brick patio walkway, juniper and winter heather shrubs, deck furniture and roofing details. Shadows and labelling were added last. Examining separate portions of the drawing will reveal techniques used in creating the *Master Plan* details.



**FIGURE 4.17.** *Red maple and brick patio.*

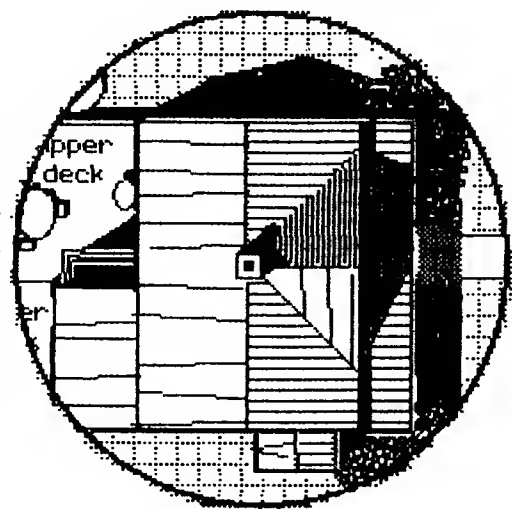
All plants began as circles or ovals. The Red Maples began as perfect circles using the SHIFT key and the HOLLOW OVAL shape. White FILLED OVALS would have erased everything under the tree. I preferred to leave a hint of what was under the tree which was the driveway edge. Although this left a grid showing, the HOLLOW OVAL was used so that there was no guessing where the driveway edge was located. The grid under the tree was ERASED and the driveway edge was lightened to a dotted line using FATBITS (Figure 4.18 A). Next, the black PAINTBRUSH was applied to the circle's edge. This made the plan view tree look more like a tree (B). SPRAY PAINT was then applied to give the tree more volume and depth (C).



**FIGURE 4.18 A-I.** *Development of shadowed walk under the tree.*

The brick paving was created directly from the **PATTERN PALETTE** using **PAINTBRUSH**. Brick paving was painted over part of the Red Maple being careful not to erase the tree outline (D). The bricks that appear under the tree were lightened with white **SPRAY PAINT** and **FATBITS** (E). Barn shadows falling on the brick were created using **LASSO**, **MARQUEE**, and **INVERT** from the **EDIT MENU**. The brick paving area to be shaded was **LASSOED** from around the tree and moved into a free working area (F). A strip of bricks was then **MARQUEED** and **INVERTED** (G). After the black portion (where the tree should be) was **ERASED** (H), the shadowed brick paving was returned with **LASSO** to its location between the barn and Red Maple tree (I).

As shadows move across different surfaces, different amounts of light are absorbed and reflected. Using different dot densities from the **PATTERN PALETTE** is effective in revealing what lies hidden in the shadows. This is shown as shadows cross from the lawn to the sidewalk or the brick paving to the driveway. Notice also the white line of the back steps in shadow (Figure 4.19). Such details make a critical difference in successful graphic communication.



**FIGURE 4.19.** *House and upper deck.*

Buildings were detailed using various line widths, most often using the STRAIGHT EDGE. One exception is the round tiled PATTERN on the Cottage Design Studio roof. After the south roof slope was filled in with PATTERN and PAINT BUCKET, the filled roof was selected and moved to the free work area with MARQUEE. FLIP VERTICAL from the EDIT turned the tiles around so that they would be in the proper direction for the roofs north slope. PENCIL dots were added to give the effect of a shaded downward sloping roof.

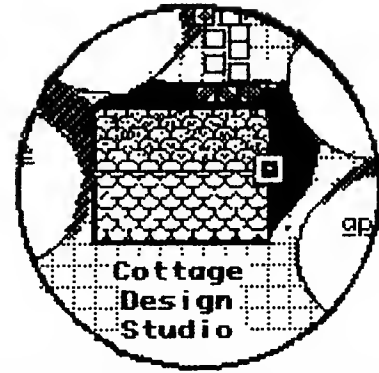


FIGURE 4.20. Cottage design studio.

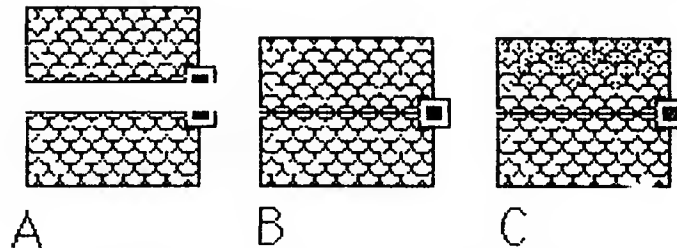


FIGURE 4.21 A-C. Roof detail for cottage.

Techniques such as these can be applied to drawings of any scale. There are many more tricks you will discover while becoming familiar with MacPaint. These techniques give drawings the depth and detail that make them not only interesting but make them communicate. You will quickly master MacPaint's techniques and achieve results similar to hand drawn pen and pencil graphics.

# Highlighting

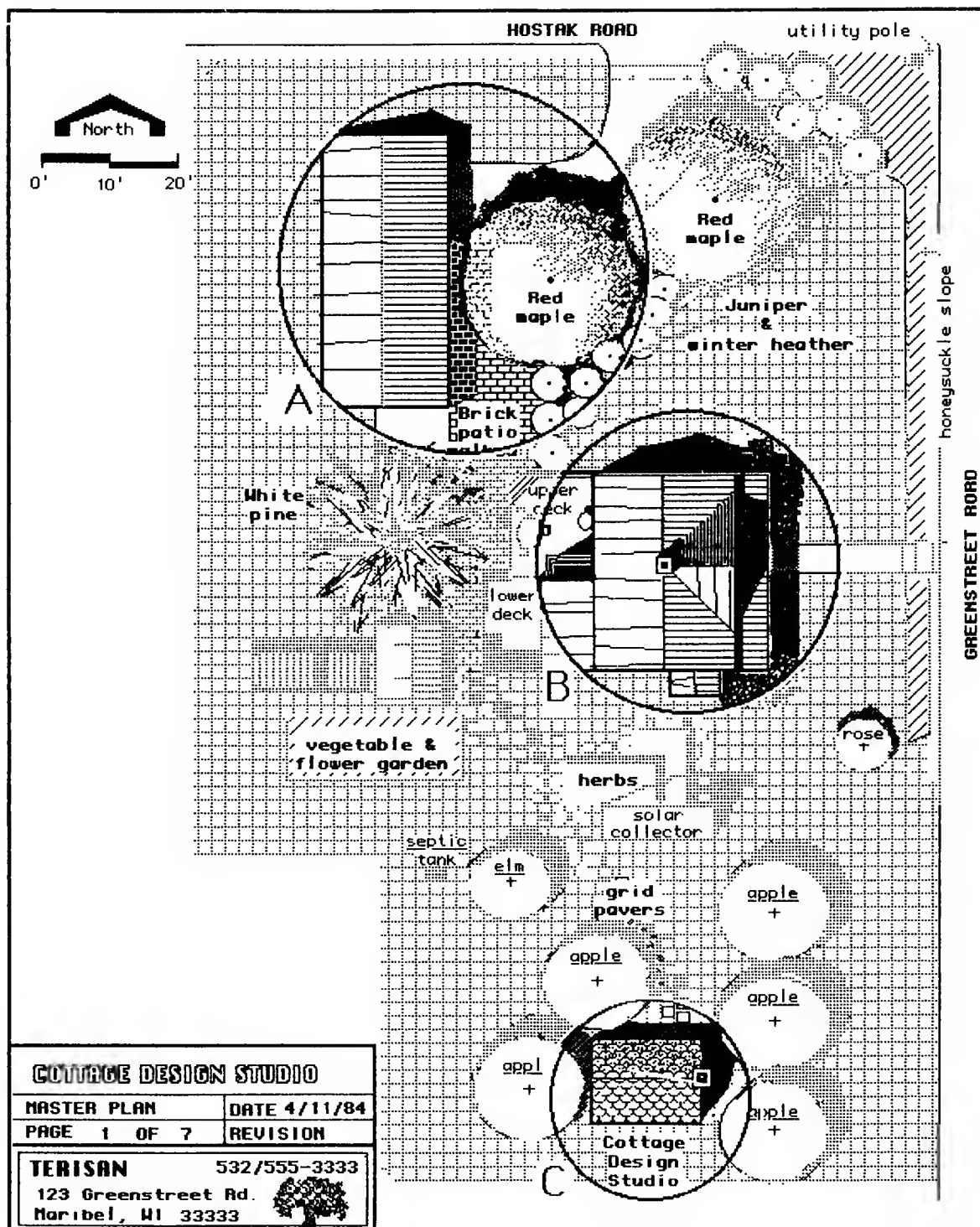


FIGURE 4.22. Highlighting a drawing by making the background lighter.

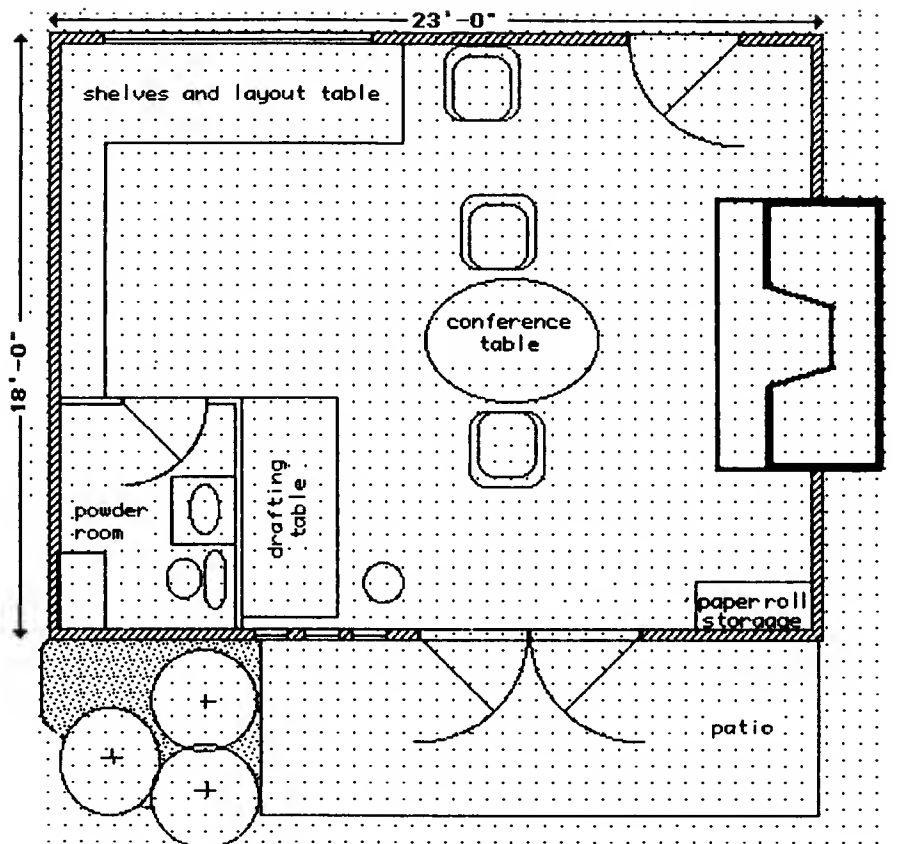
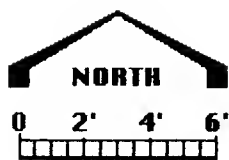


drawn to detach the area from the rest of the drawing. This second circle, however, is white; achieved with the HOLLOW OVAL, the SHIFT and OPTION keys and the solid white PATTERN. Then when the PAINT BUCKET and the fine, dotted PATTERN are applied to solid lines outside the circle, the white, invisible circle will keep the dotted paint from spilling into the circle. Placing a white circle on the screen may require two or three tries. You must keep your eye on what is disappearing from the drawing to know where the white circle is currently located. An alternative is to use the white PAINTBRUSH and paint a white strip around the black bordered circle. But as you know by now, this requires a good amount of dexterity.

Once there are no lines touching the black-bordered circle, you are ready to use the PAINT BUCKET and the fine, dotted PATTERN to lighten the unimportant black lines of the drawing.

The second example of highlighting is easier and has higher contrast. Only one HOLLOW OVAL is drawn around the area of interest. Then the fine, dotted PATTERN is poured between solid lines onto the entire screen. Just as the solid black circle keeps out the paint, there may be other enclosed areas that will have to be hit separately with the PAINT BUCKET. You may want to experiment with different dot PATTERNS using this second technique. The approach used to highlight depends on the type of drawing and the amount of contrast desired.

The next section takes us into the interior of the Cottage Design Studio shown on the *Master Plan* in Area C (Figure 4.20).



**FIGURE 4.24.** Floor Plan.

## ***Floor Plans***

Floor plans are one of the most useful drawings you will create with MacPaint. Once you have a floor plan it can be used for laying out and rearranging furnishings in an interior. The first step is to determine the scale of the floor plan.

If the floor plan is to cover less than 6" of paper and one square is to represent 1 foot for 23 feet, how many dots per square will there be if there are 72 dots/inch and 23 squares?

$$(72 \text{ dots/inch}) * (6 \text{ inches}) = 432 \text{ dots}$$

$$432 \text{ dots}/23 \text{ squares} = 18 \text{ dots/square (round down to whole \#)}$$

Eighteen dots will be equivalent to one foot. Remember that in a grid where each square is sharing a dot with the next square, there are really only seventeen dots per square except for the last square, which has eighteen. So to find exactly how many inches the floor plan will need, you must do the following:



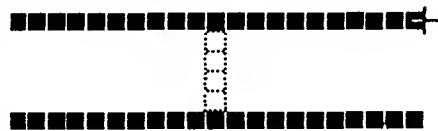
**(17 dots/square) \* 23 squares + 1 dot = 392 dots**

**392 dots/72 dots/inch = 5.4 inches**

Notice that the scale has worked out conveniently so that nine dots equal six inches. There is no need to create a new grid system since there are two in the **PATTERN** palette which are based on a nine-dot square, the coarse, dot grid and the larger solid line grid. For variety, the coarse, dot grid was selected for **Floor Plan** and **South Elevation**.

If nine dots represent six inches, a four-inch wall would be drawn with a line six dots wide. Since there are no half dots, a three-inch wall would have four or five dots. As lines representing walls are not usually solid, two lines are drawn to represent the two sides of a wall. The space between the lines represents the space in the wall for insulation, electrical wiring and piping.

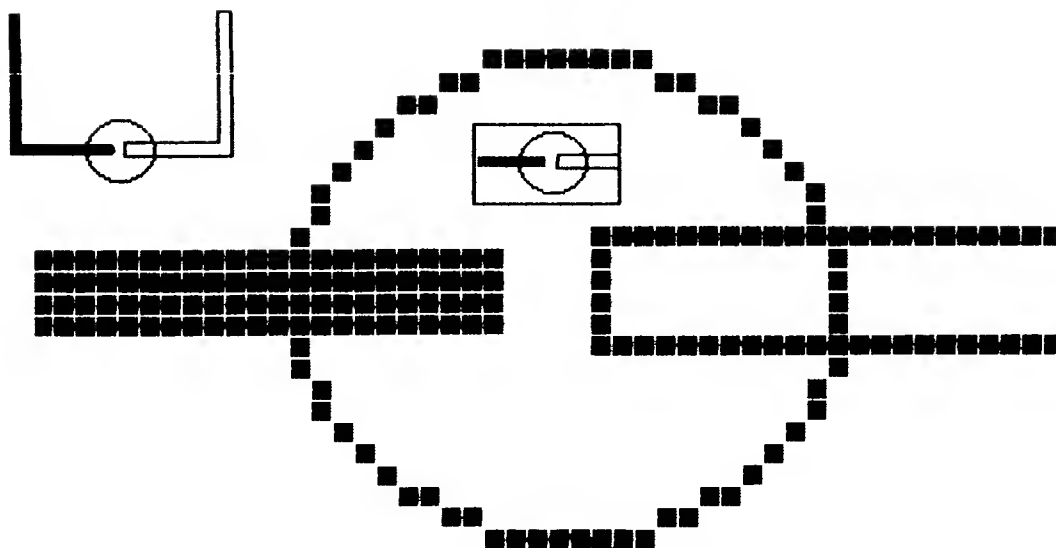
Laying out the interior and exterior walls can be done in two ways. One is to use the thinnest line, one dot wide, from the **BORDER LINE WIDTH PALETTE** to draw the outside of the exterior wall using the **STRAIGHT EDGE**. Then go to **FATBITS**, count the sixth dot position over starting with the dot in the line. At the sixth dot position, start the second line for the wall. Returning to the normal screen and **STRAIGHT EDGE**, finish drawing the walls. Interior walls would be similarly drawn, but with the lines two dots apart instead of four.



**FIGURE 4.25.** *Exterior wall begun in **FATBITS**.*

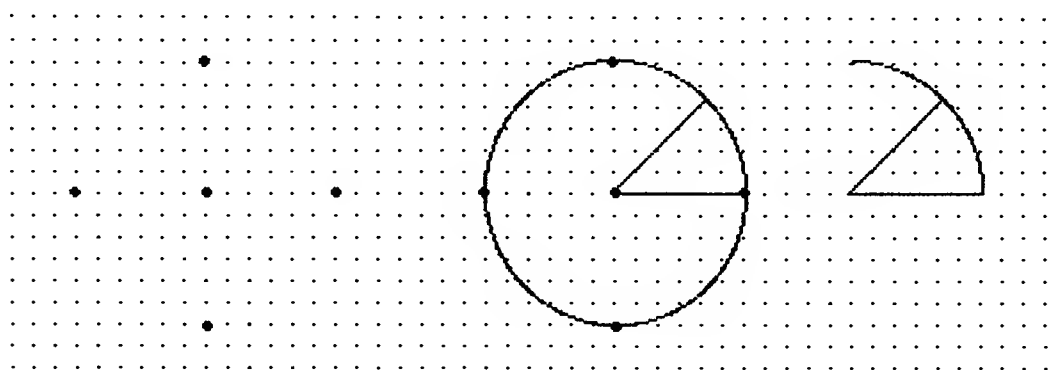
The second method is convenient to use when the number of dots in the **BORDER LINE WIDTH PALETTE** and scale works out right. Drawing the wall as a solid black line, then using **TRACE EDGES**, creates the double lines in fewer steps. In this method you only need to draw the line once for the wall. The dot number in the line width, however, does not always lend itself to this method. Let's examine the **BORDER LINE WIDTHS** and **TRACE EDGES** more closely.

**BORDER LINE WIDTHS** are in one-dot, two-dot, four-dot, and eight-dot widths. Using **TRACE EDGES** around a four-dot line creates a total distance of six dots, perfect for a four inch wall. If three-inch interior walls are represented by four dots then the two-dot **BORDER LINE WIDTH** would be easily converted with **TRACE EDGES**.



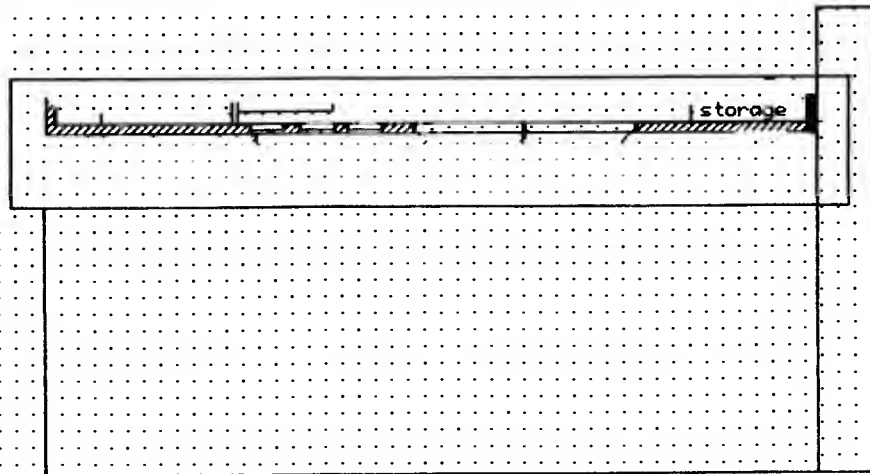
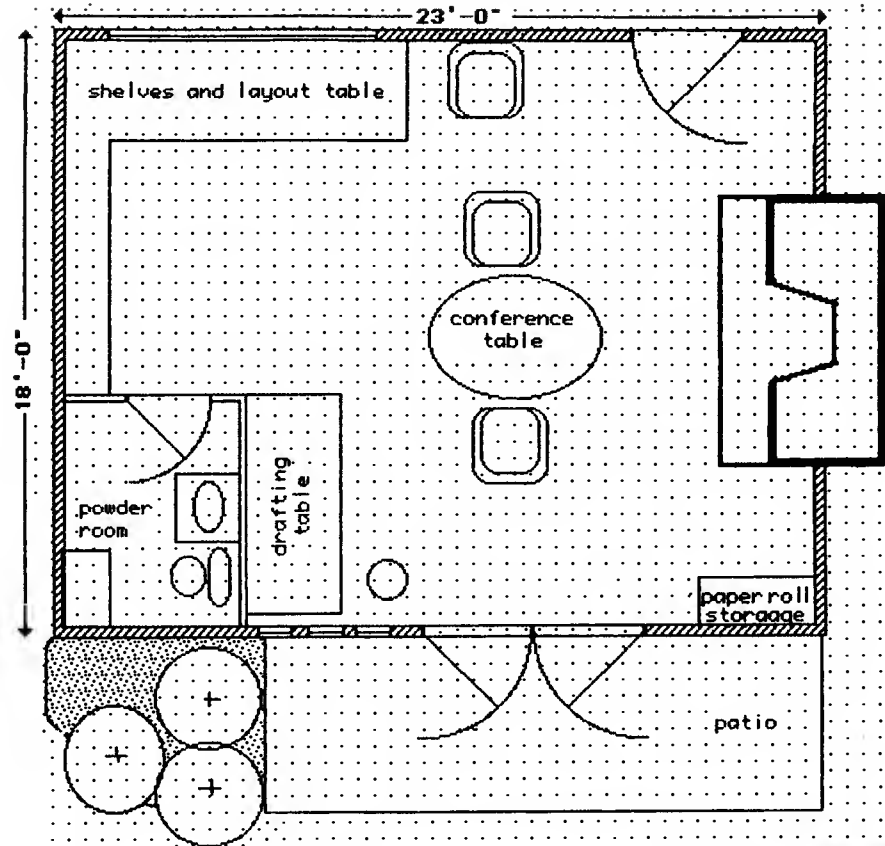
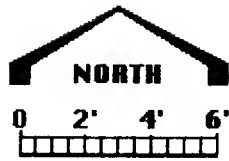
**FIGURE 4.26.** Enlarged view of the four-dot **BORDER LINE WIDTH** with **TRACE EDGES** applied.

After the walls are drawn as close to scale as possible you are ready to put in windows, doors, fireplace, and furnishings. **HOLLOW SHAPES** and **STRAIGHT EDGE** tools were most frequently used in the **Floor Plan**. The exterior wall was filled with the diagonal line **PATTERN** and **PAINT BUCKET**. Door symbols were the only thing which required extra effort. They were created in a work space that had the same dot grid as the floor plan. Planning for a three-foot wide door, a mark was made on a grid dot that was to become the center of a circle. Using the same scale as the **Floor Plan**, another mark was made three scaled feet from the first mark. This was repeated in three other directions. These marks were used to size a circle which would become the arc of the door symbol. A perfect circle was laid over the four marks using the **HOLLOW OVAL** and the **SHIFT** key.

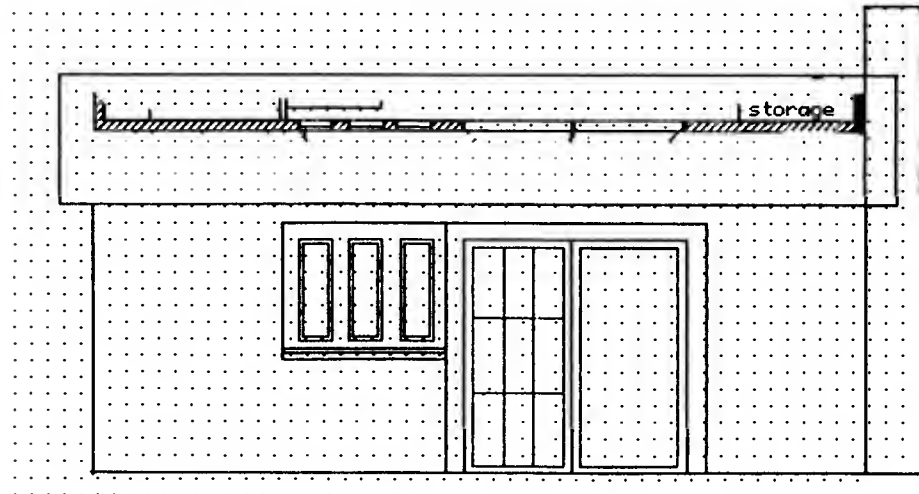
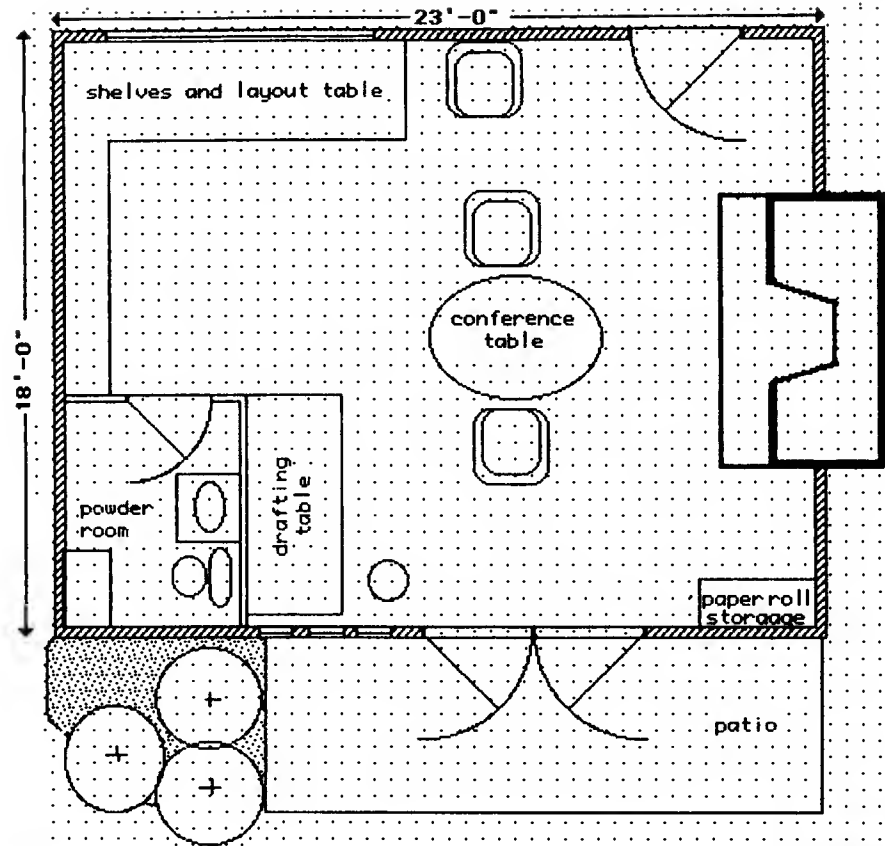
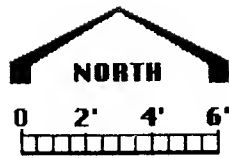


**FIGURE 4.27.** Creating scaled door symbols.

The **STRAIGHT EDGE** and **SHIFT** key were used to add a horizontal line and a 45° line. Three fourths of the circumference was **ERASED** leaving a door symbol which fits in the **Floor Plan**. The door symbol was then **ROTATED** or **FLIPPED** when necessary and moved into place with **LASSO**. The Powder Room door is smaller than exterior doors, but the same procedures were used to create the smaller door symbol. As usual, the labels were added last.



**FIGURE 4.28.** An elevational drawing is drawn from the floor plan.



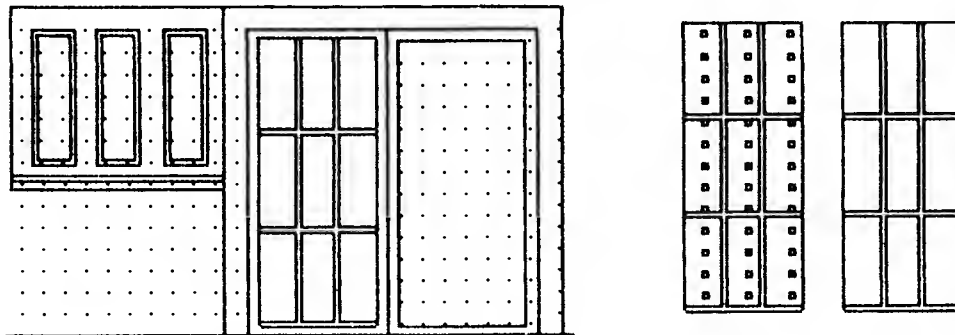
**FIGURE 4.29.** Windows and doors added to the elevation drawing are in line with the floor plan's window and doors.

## Elevation Drawing

The South Elevation scale was drawn at two 9-dot squares to the foot, the same scale as the Floor Plan. Consistent scale of the drawings made it convenient to extend lines off the plan onto the south facing elevation. Rather than drawing

guidelines off the plan, which would need tedious ERASING later, the south wall of the Floor Plan was LASSED and COPIED to the CLIPBOARD and on to the page below the Floor Plan.

The plan view portion of the south wall provided enough information to guide the placement of walls, doors, windows and other details in the elevation drawing. The STRAIGHT EDGE was used to draw walls, doors and windows. Window mullions were drawn in one door, then removed to a working space using MARQUEE. TRACE EDGES was applied to the mullions, quickly giving them volume. The traced mullions were placed in both doors with the same blinking MARQUEE that originally surrounded them.



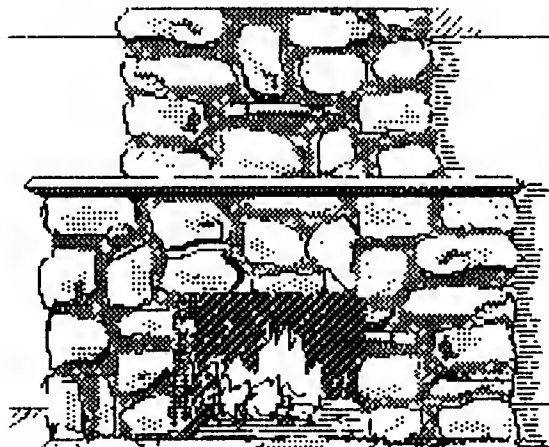
**FIGURE 4.30.** *Window mullions in doors.*

The roofing and exterior siding were applied using PAINT BUCKET and PATTERNS. Shading was applied as though there was a morning sun. Shadows were drawn to the west. Window treatment was applied with the large, square PAINTBRUSH and black paint. A touch of white PENCIL line and white diagonal line SPRAY PAINT was added to give windows a glass-like impression. The drafting stool appears behind the doors. Notice that the stool legs are white when the background is black; PENCIL and FATBITS were used. Vegetation was begun using PENCIL for the outline and the criss-cross dot PATTERN.



**FIGURE 4.31.** Elevation filled in with *PATTERN* to add impression of shadows and building material.

In case the South Elevation looked too easy for you, I've saved chimney detailing to give the drawing challenging shortcuts. Whenever you can save yourself tedious drawing, you will have more time and energy for better drawings. I enjoy finding shortcuts in MacPaint, but drawing stone detailing more than once is less than fascinating. Consequently, the stone chimney detailing took advantage of a drawing which had already been completed but will be presented in its entirety later in this chapter. This will give you an opportunity to see how to gain access to other drawings on other diskettes while you are in the middle of building a drawing.



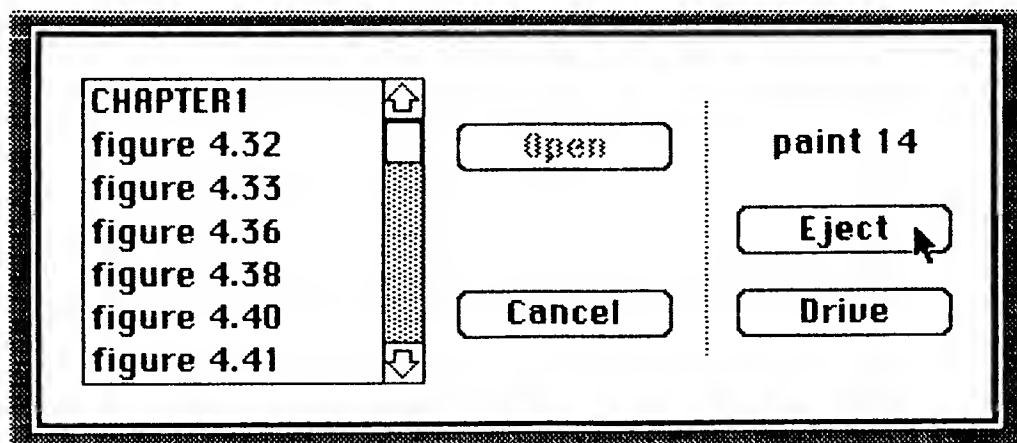
**FIGURE 4.32.** Fireplace taken from *Reception Area* that appears later in this chapter.

Stone detailing came from the fireplace, shown in Figure 4.32, of another drawing called *Reception Area*, which can be seen on page 174. When I decided that it would be easier to cut and paste portions of the fireplace onto the chimney,

I didn't realize that the drawing existed on another diskette. This is when I discovered the usefulness of EJECT (Figure 4.34) when retrieving another drawing document.



**FIGURE 4.33.** Selecting OPEN displays dialogue box listing documents on the diskette.

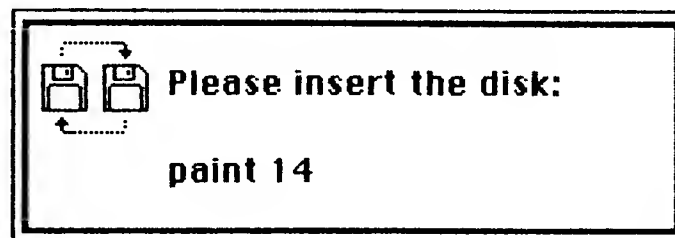


**FIGURE 4.34.** Dialogue box after selecting OPEN from the FILE menu.

The following steps are instructing you to get a drawing from another document on another diskette, COPY it to the CLIPBOARD, and PASTE it onto the workspace of the current drawing. The assumption is that you have no external disk drive. The instructions use the fireplace and chimney as examples.

1. **CLOSE** the current drawing document—in this example, the document holding the elevation drawing.
2. Select **OPEN** from the **FILE MENU**, Figure 4.33.
3. Select **EJECT** from the dialogue box.
4. Put in the diskette that holds the drawing information you need.

5. Documents on the second diskette will be listed in the dialogue box similar to the box shown in Figure 4.34; select the one you need and click OPEN—if you don't see the document you want, select EJECT again and insert another diskette.
6. COPY, using LASSO or MARQUEE, the necessary portion of the drawing—the fireplace;
7. CLOSE the document.
8. Select OPEN from the FILE MENU.
9. Select EJECT from the dialogue box.
10. Place the original diskette with the current working drawing into the drive.
11. Select the current working document from the dialogue box and OPEN it—the diskette will pop out and you will be requested to put the second diskette into the drive; this procedure may occur two or three times before you will be ready to go on to the step 12.




**FIGURE 4.35.** Dialogue box instructions to insert into the drive a diskette called "paint 14".

12. PASTE the image—the fireplace—onto your current drawing.

Twelve steps were required to get information from one document to another. This actually required less than two minutes, less time than it would have taken to redraw the stone details.

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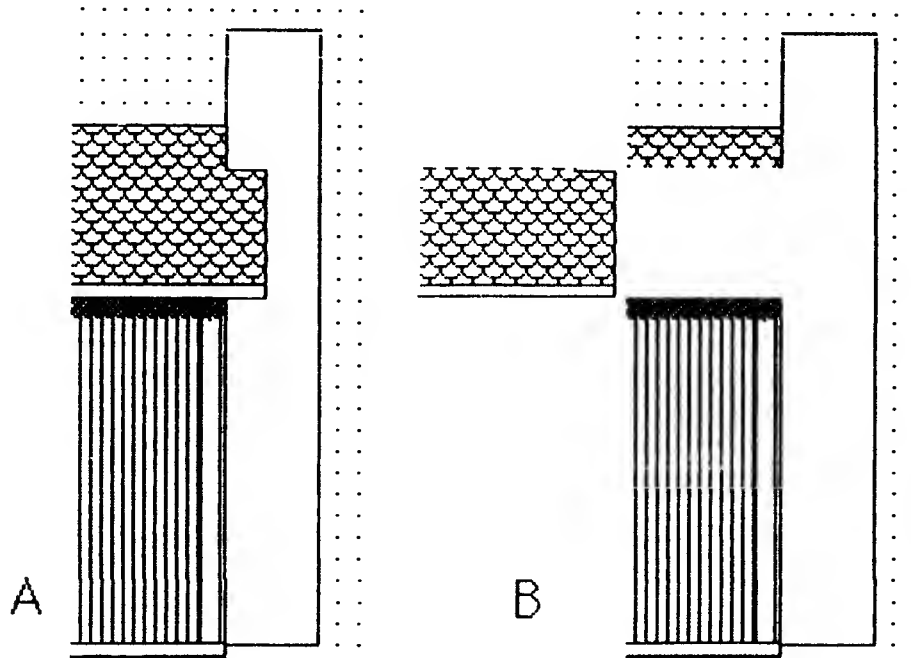
 There are at least two other ways to eject a diskette from its drive: Press the COMMAND key and the letter "e" simultaneously, or, press the SHIFT key, the COMMAND key, and the number "1" simultaneously. If you have a second disk drive and want to eject the diskette, you would press the number "2".

---

To transfer the stone work from the fireplace to the chimney, first the chimney-end of the cottage was MARQUEED with the OPTION key. The chimney was relocated near the fireplace in the free work space. The roof was removed using MARQUEE and the SHIFT key. Removing the roof portion from the chim-



ney area made it easier to fill the chimney with stone. When using MARQUEE with SHIFT to return the roof to its original position, the roof will overlap the chimney.



**FIGURE 4.36.** *Removing a roof portion in order to add stonework to the chimney.*

Portions of the fireplace were MARQUEED and fitted to the chimney. Since the fireplace portion was too wide, it was thinned down with the ERASER and the SHIFT key. It was then MARQUEED, FLIPPED HORIZONTALLY, and moved into place at the bottom of the chimney. This process was repeated until the chimney was covered with stone. Any inconsistencies in the chimney's stonework were cleaned up with PENCIL or PAINTBRUSH. The roof portion (which had earlier been removed) was slid back into place with MARQUEE and SHIFT. With the chimney finished, it had only to be moved back into its place on the cottage. The LASSO was used to transfer the chimney to the CLIPBOARD for temporary holding while the window was moved from the work space to the cottage. The chimney was PASTED into place.

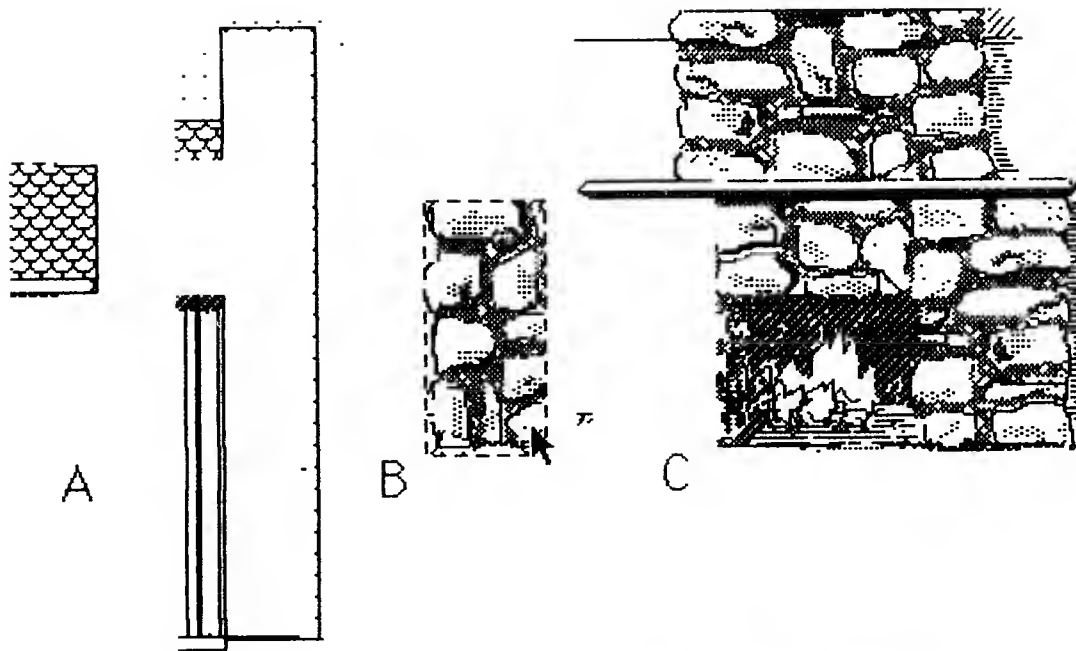


FIGURE 4.37 A-C. Fireplace stonework becomes part of the chimney using MARQUEE.

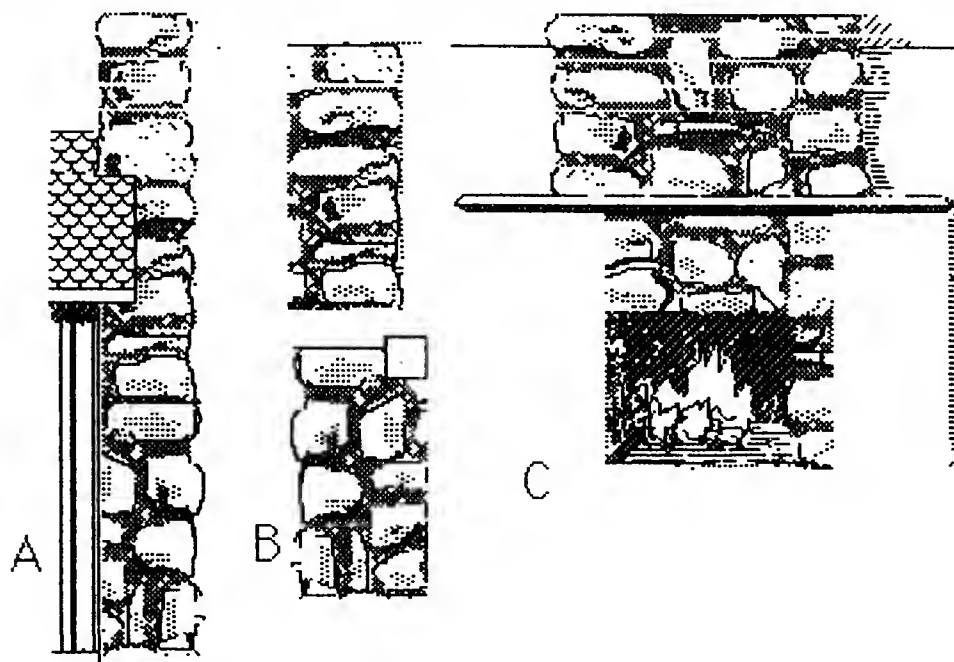
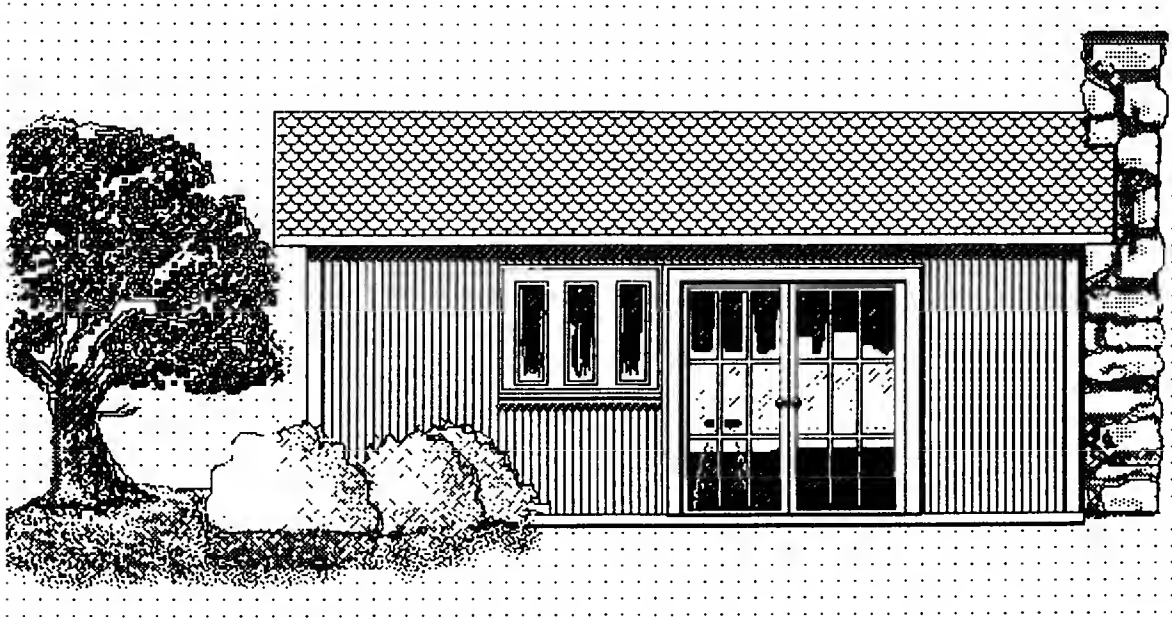


FIGURE 4.38 A-C. Time is saved by not having to redraw stonework stored on another document.

The final step in the South Elevation was adding a tree and groundcover. The trunk and branches were drawn with PENCIL. Tree foliage was SPRAY PAINTED with the random square dot PATTERN. MARQUEE and TRACE EDGES were applied to the foliage. TRACE EDGES not only gave the foliage the texture I wanted, but also gave the branches volume, like the window mullions, which had

previously just been PENCIL lines. Last, shading was added with PAINTBRUSH and SPRAY PAINT to the ground and tree trunk.



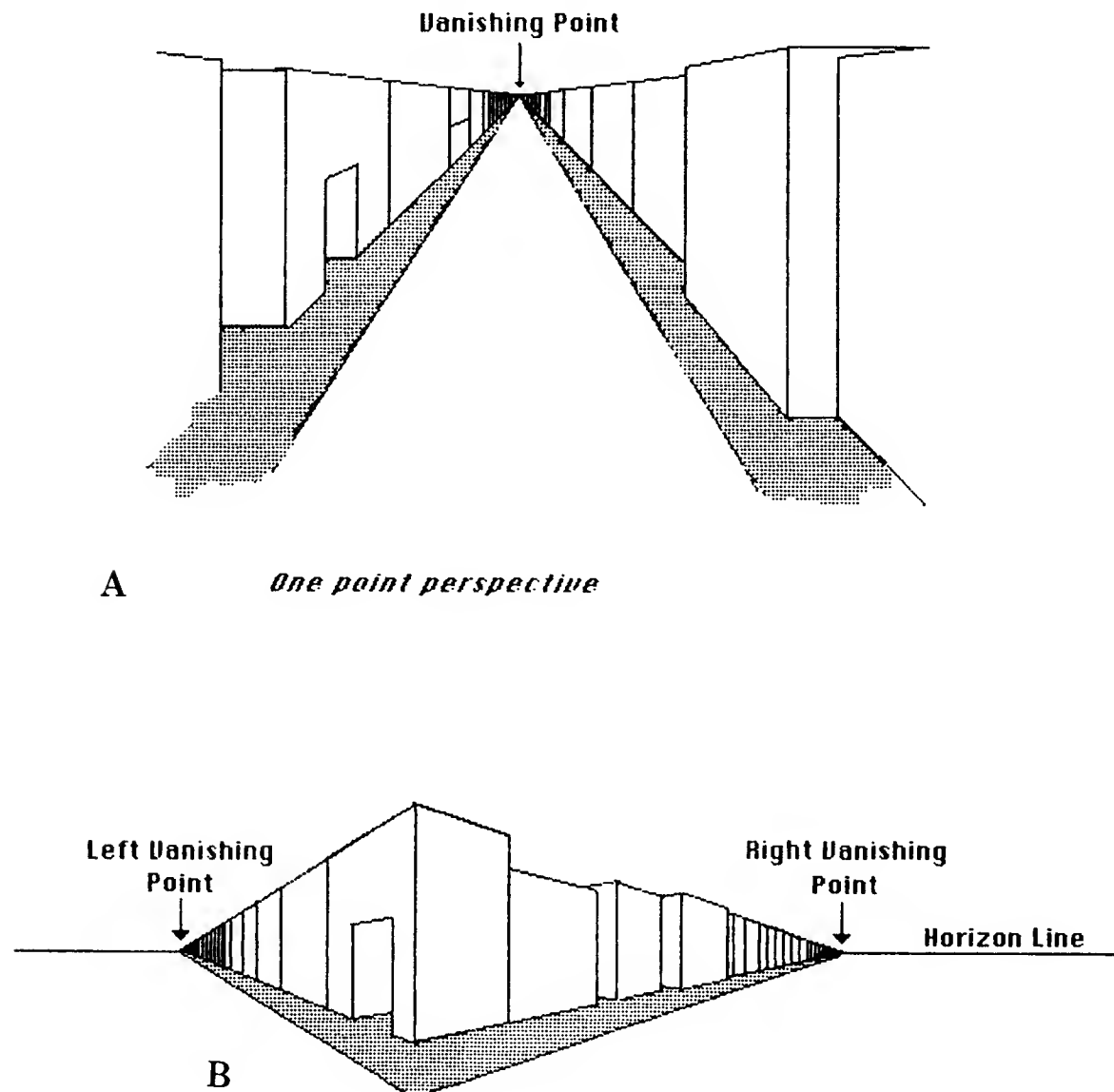
**FIGURE 4.39.** *South Elevation—cottage design studio.*

Learning to be creative with cut and paste routines requires a good understanding of LASSO, MARQUEE, CLIPBOARD, CUT, COPY, PASTE, and how to access other documents and diskettes. Although there were many small steps in this chimney example, they will lead you to a better understanding of MacPaint and its shortcuts.

## ***Perspectives***

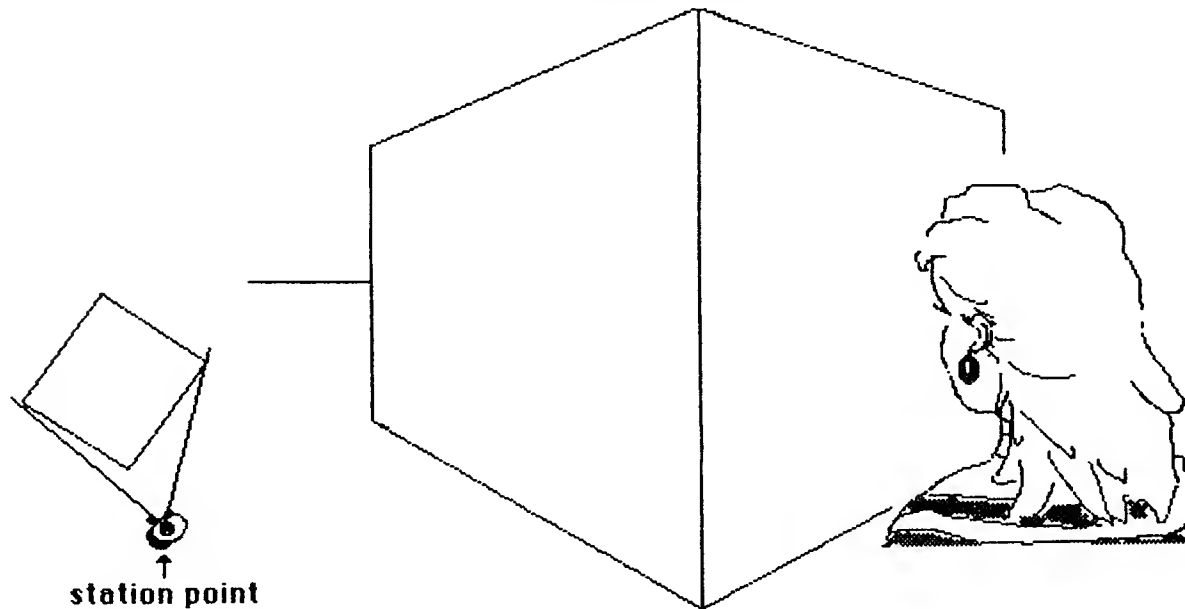
If you recall the earliest drawings in Chapter 3 (*Girl and Butterfly on a Toadstool*) were loose, with a free-hand style using only a PENCIL and PAINTBRUSH. Then control of drawings was emphasized by creating objects of specific size and placement with a strategy in building the drawing (*Shapes and Alley Cat*). As you became more confident in the use of MacPaint you created larger drawings that occupied more than one window screen using CLIPBOARD and SCRAPBOOK. Next an entire project was developed on MacPaint—the cottage design studio. In the first phase a base map was developed that was scaled to fit on one MacPaint page. Overlay mapping was the emphasis of *Site Analysis*. With *Master Plan* there was a concern for details, more illustrative graphics, and highlighting. *Floor Plan* offered a brief pause in learning new MacPaint techniques but it was a natural progression in the design process. And finally, *South Elevation* expanded beyond the limits of one diskette, providing a library of drawings to access. Each drawing in Chapter 3 used information from the previous drawing while expanding rapidly into new techniques and areas. The drawing types yet undiscussed are perspectives.

Perspective drawing is the depiction of three-dimensional objects on a two-dimensional medium, usually paper or in this case, a computer screen. Artists and engineers create perspectives to give the illusion of depth, distance and an effect of space and volume. As you view objects in life that are farther away, there appears to be a foreshortening of lines. Lines, forms, patterns, and textures not only appear smaller, but appear to be more densely crowded and, therefore, darker. In transferring that visual information to a perspective drawing, lines have points where they converge and vanish, called vanishing points. If all lines in a drawing converge at one point, the drawing is called a one-point perspective. If the lines meet at two points, the drawing is vanishing away in two directions and is called a two-point perspective. Compare the difference in Figure 4.40.

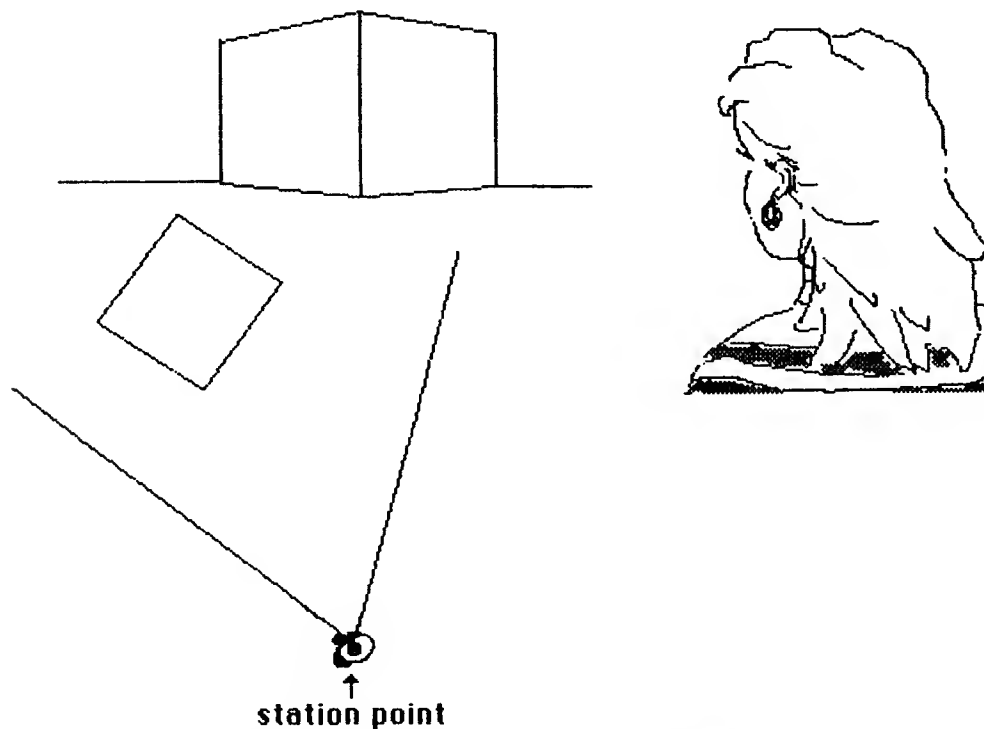


**FIGURE 4.40 A-B. One-point (A) and two-point (B) perspective.**

In a technical perspective drawing, the vanishing points sit on the horizon line. The horizon line depicts a view that is roughly eye level, three to five feet above ground. The horizon line and vanishing points are established in relation to the station point, which is where an observer would be standing to view the drawing subject. To produce technically accurate perspective drawings, the station point, horizon line, and vanishing points must be established.

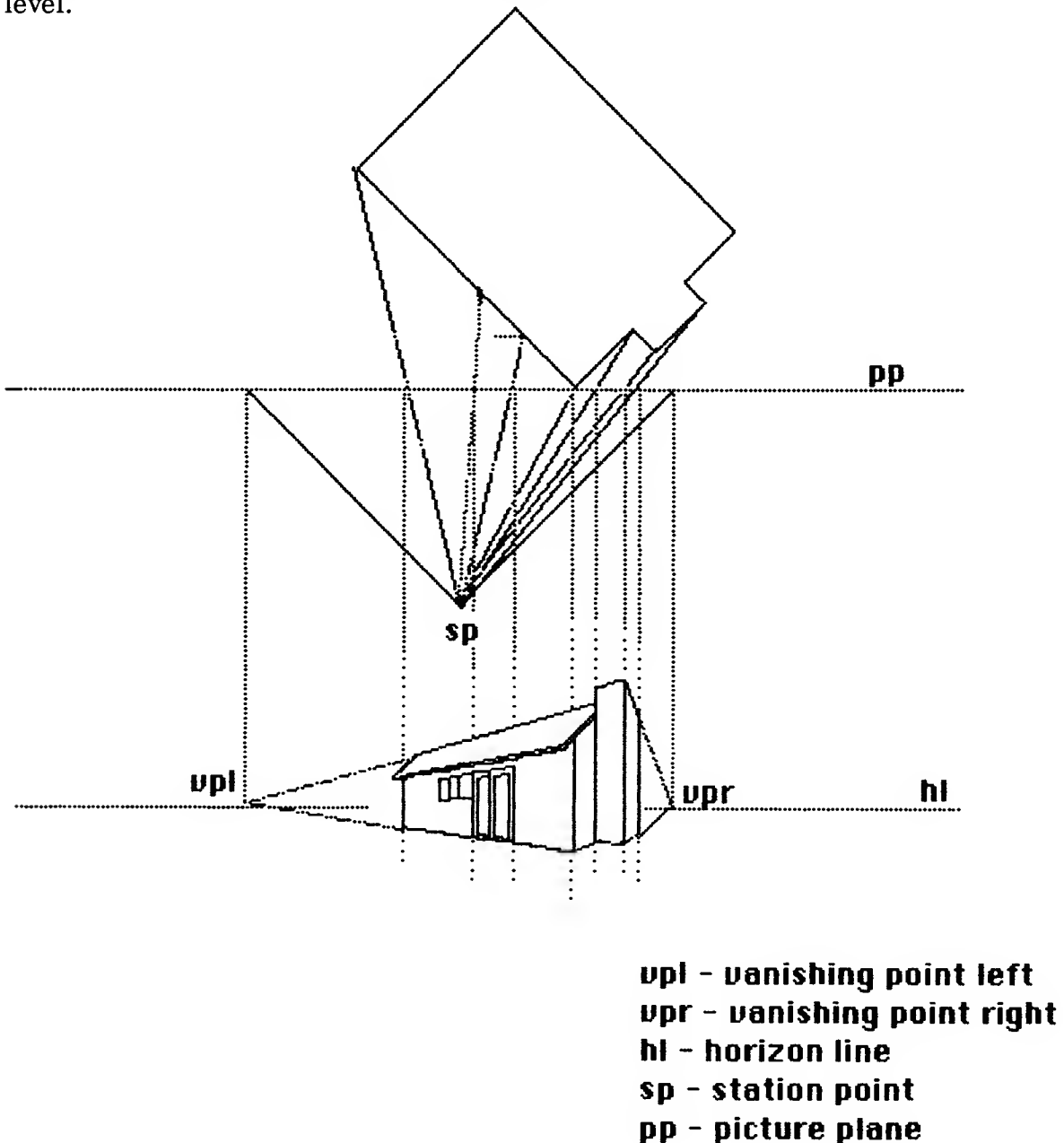


**FIGURE 4.41.** *The station point is the point where the viewer is standing.*



**FIGURE 4.42.** *As the station point changes, so do the angles and proportions of the object viewed.*

One common method used to develop a perspective drawing is to use a plan view and elevation drawing of an object. Lines are projected from the plan view drawing relative to vanishing points, horizon line, picture plane and station point. The perspective set up in figure 4.43 was created without the help of an elevation drawing. Therefore, the height of the building and its horizontal lines was estimated relative to the horizon line, which was assumed to be three feet above ground level.



**FIGURE 4.43.** *Setting up guidelines for a two-point perspective.*

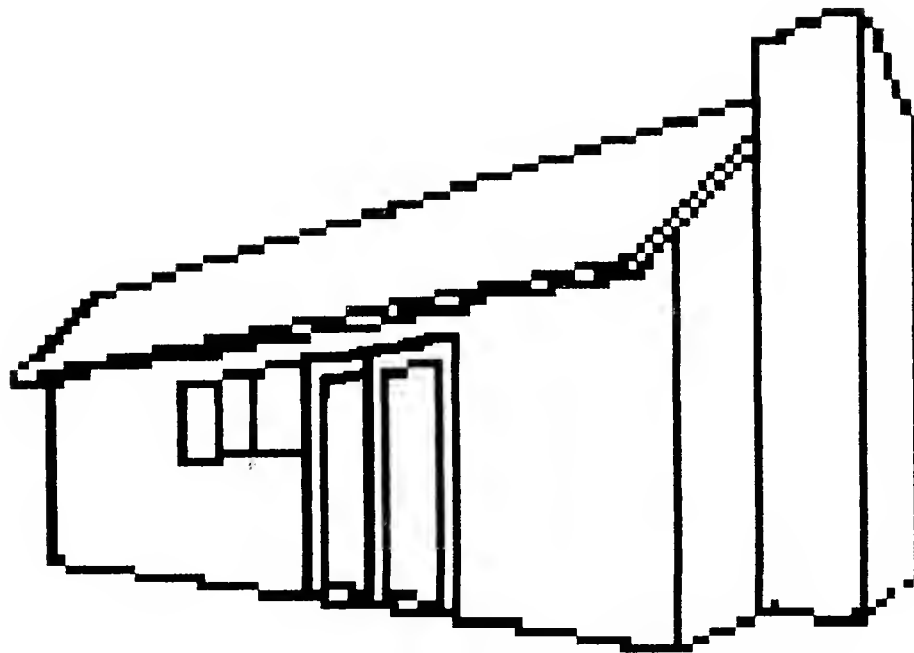
The STRAIGHT EDGE icon can be used entirely throughout the drawing setup.

1. The first step is to lay out the building plan at a 45° angle to the picture plane (pp). The STRAIGHT EDGE and SHIFT key produce consistent 45° lines that facilitate the perspective setup.
2. Arbitrarily set the station point (sp). You will need to SCROLL the window down to set the station point far enough away (about three inches) to minimize distortion.
3. Draw lines from the station point parallel (at a 45° angle) to the building plan.
4. Where the lines intersect the picture plane, drop to the horizon line (hl) to establish the right and left vanishing points (vpl, vpr).
5. Draw lines from the station point to each of the points on the cottage plan-window and door edges, chimney and building corners.
6. At the point where these lines cross the picture plane, drop lines perpendicularly to the horizon line. These lines, between the picture plane and the horizon line, are where the vertical building lines occur on the perspective drawing.

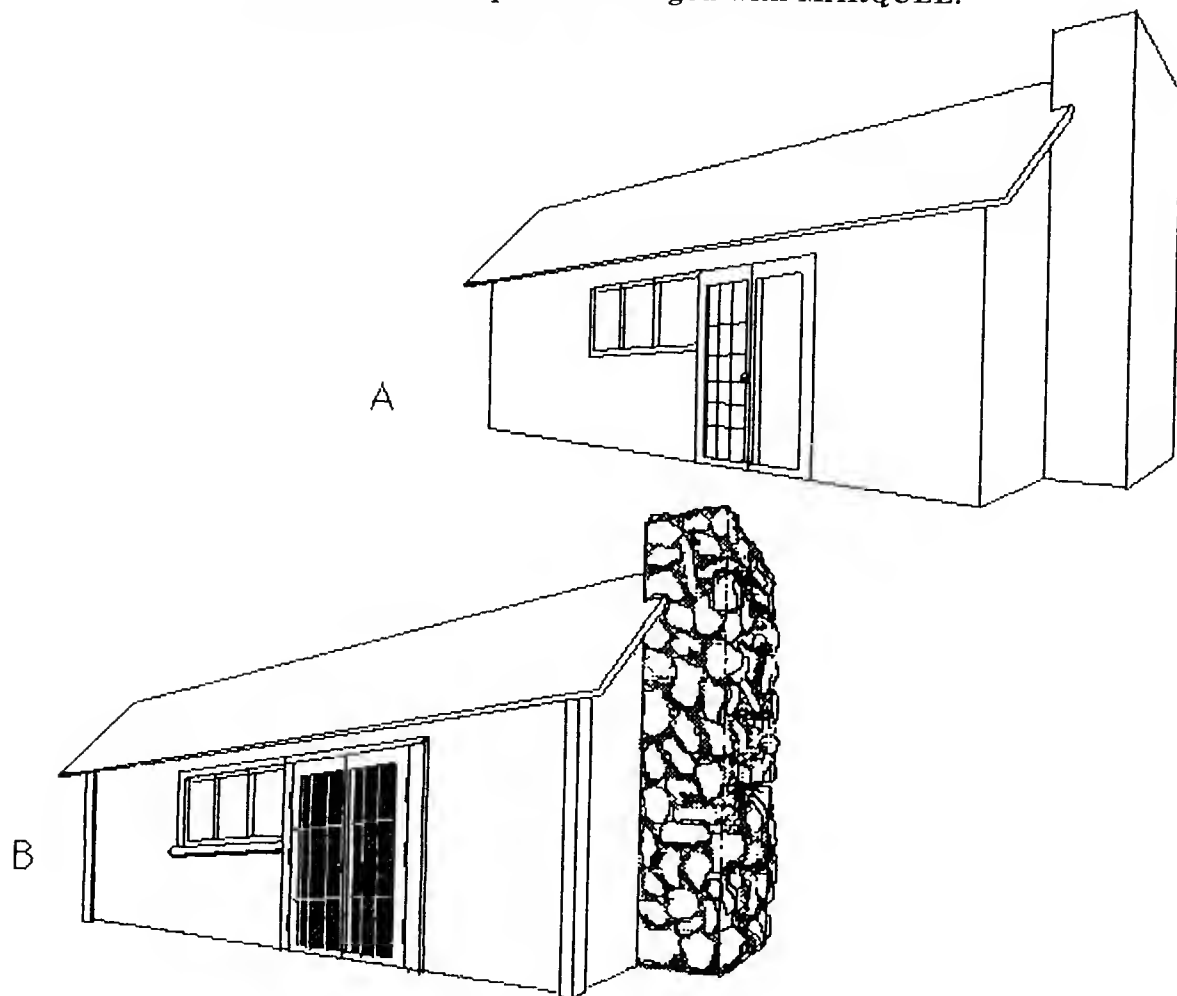
Heights of horizontal lines on the building are estimated from the corner of the building that sits on the picture plane. Any point on the picture plane which is a vertical line in perspective is at the same scale as the plan and is considered to be the true height. Remember, we set the horizon line at about three feet above ground level. So three feet of the cottage is below the horizon line and we assume five feet above the horizon line to be the top of the wall or the eave line. Relative to the true height line of the cottage, all other horizontal lines, which are the tops or bottoms of windows, doors, or walls, are drawn toward their respective vanishing points.

Setting up a two-point perspective, even one as simple as the cottage design studio, begins to test MacPaint's limits on an 8" x 10" page. The plan view, station point, and horizon line will not all fit on one window screen simultaneously. There is frequent SCROLLING between the plan and the lines intersecting the horizon line to determine which line belongs to what part of the plan. A print-out is helpful to see the whole perspective setup before drawing in the horizontal building lines. Notice when the vertical guidelines are lightened with the PAINT BUCKET and the dotted PATTERN, the lighter guidelines minimize confusion when drawing in building lines.

After all that work, you may not be impressed with the size of the perspective...but, remember the MARQUEE, COMMAND and SHIFT keys (see Figure 4.44).



*FIGURE 4.44. Perspective enlarged with MARQUEE.*

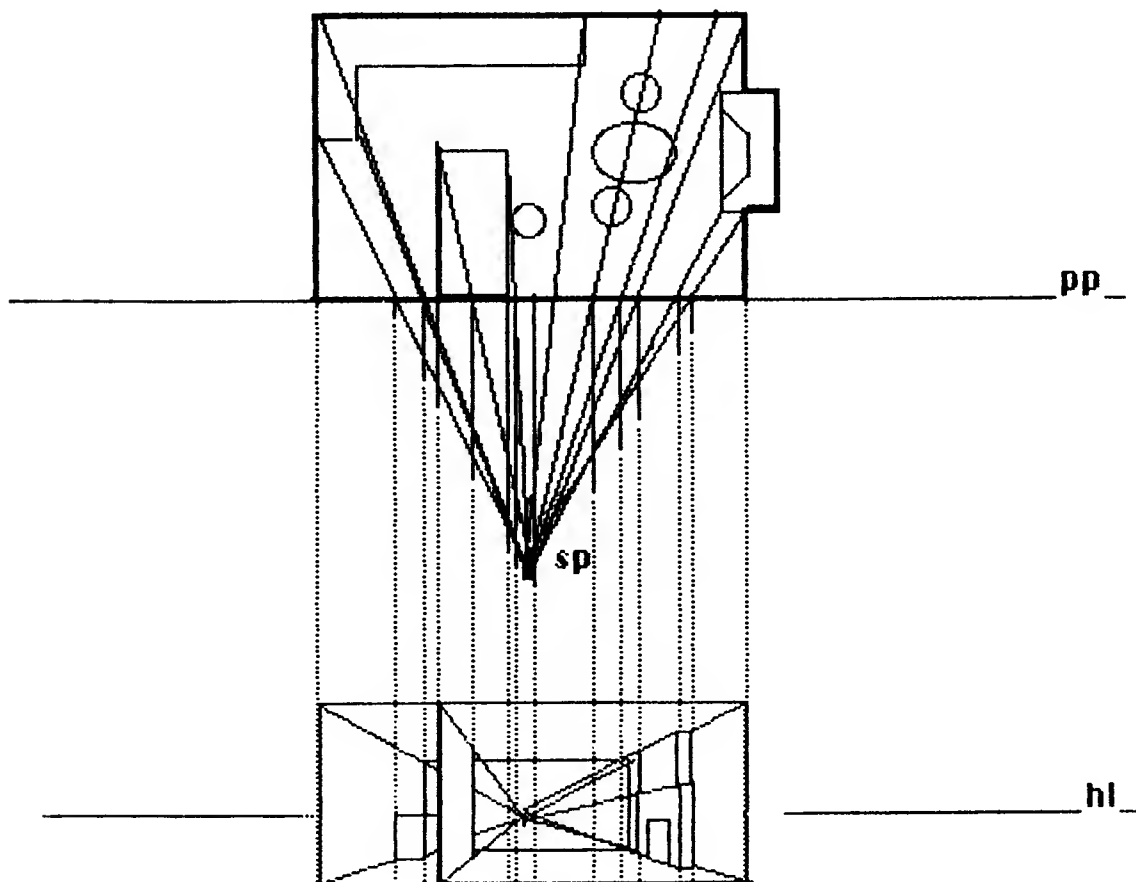


*FIGURE 4.45 A-B. Final rendered cottage is shown on Chapter 4 title page.*

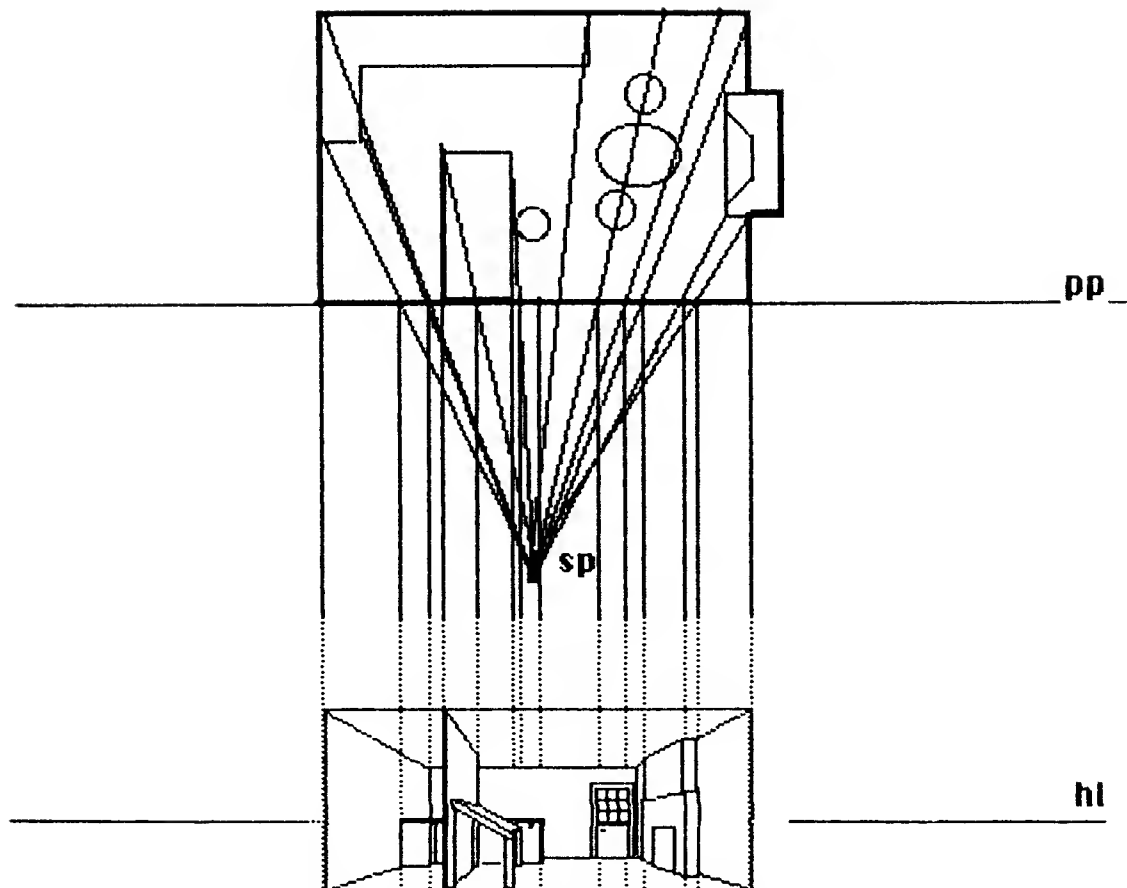


Now there is a perspective to which it is worth adding details. Since the stretching feature of the MARQUEE leaves the building with fat lines, the lines were ERASED one at a time and replaced with a single dot line of STRAIGHT EDGE. The Chapter 4 title page shows how the perspective was finally rendered. The final rendition made the beginning perspective work worthwhile.

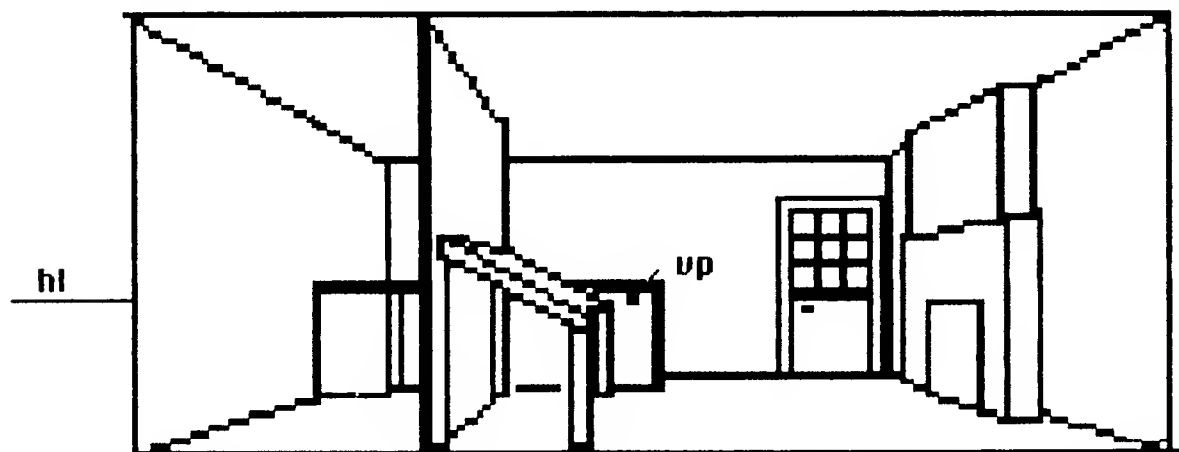
Let's look briefly at one-point perspectives. One-points are set up similar to the two-point perspectives. The single vanishing point lies on the horizon line perpendicular to the station point (Figure 4.46). Lines that are perpendicular in plan to the picture plane, north-south lines, are the lines that converge to the vanishing point in perspective. Lines in plan view that are parallel to the picture plane, east-west, remain horizontal in perspective. Figures 4.47 and 4.48 show a simple one-point perspective set up using the same methods as the two-point. The drawing in Figure 4.47 was enlarged with the MARQUEE, SHIFT, and COMMAND key resulting in Figure 4.48. At this point, the perspective is ready for fine lining and final rendering.



**FIGURE 4.46.** Guideline setup for a one-point perspective.



**FIGURE 4.47.** Interior wall and window lines added before enlarging the perspective.



**FIGURE 4.48.** One-point perspective enlarged with MARQUEE. Notice the vanishing point (vp) at the back wall.

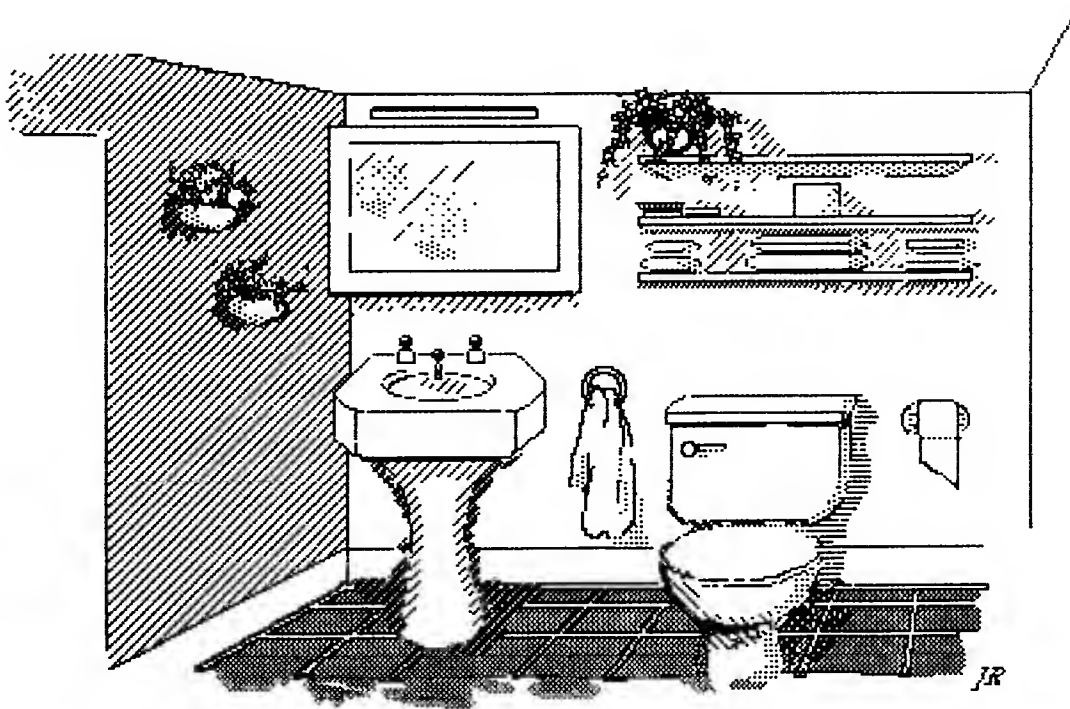
## Vignettes

The following interior sketches are a loose form of a one-point perspective drawing. These sketches have not been set up as one points from a plan view. Rather, floor and ceiling lines were sketched out with the STRAIGHT EDGE forming a

rough perspective. The vanishing point and reference to which room furnishings could be drawn was afterward determined by extending the floor and ceiling lines until they met. So an outline of the room was drawn, then the vanishing point was established so that the rest of the room could be drawn in properly.

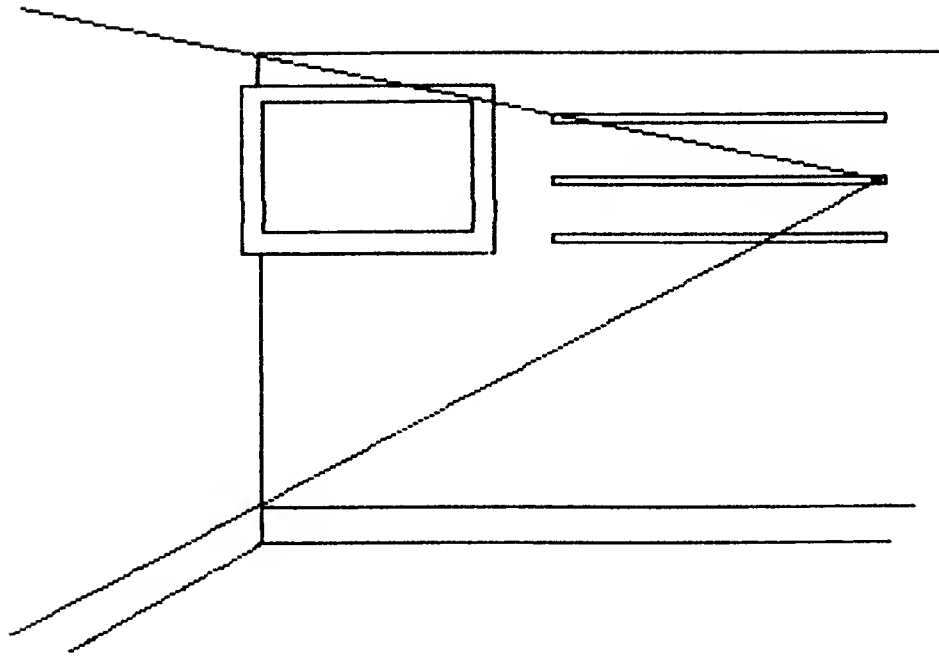
There are three vignettes—partial pictures whose edges tend to fade. The Powder Room, Reception Area, and Work Station vignettes are discussed more generally than previous drawings since, by now, you are familiar with MacPaint's tools and procedures. Following two of the vignettes are charts (Table 4.1 and 4.2) indicating MacPaint tools used for various objects in the sketch.

## Powder Room



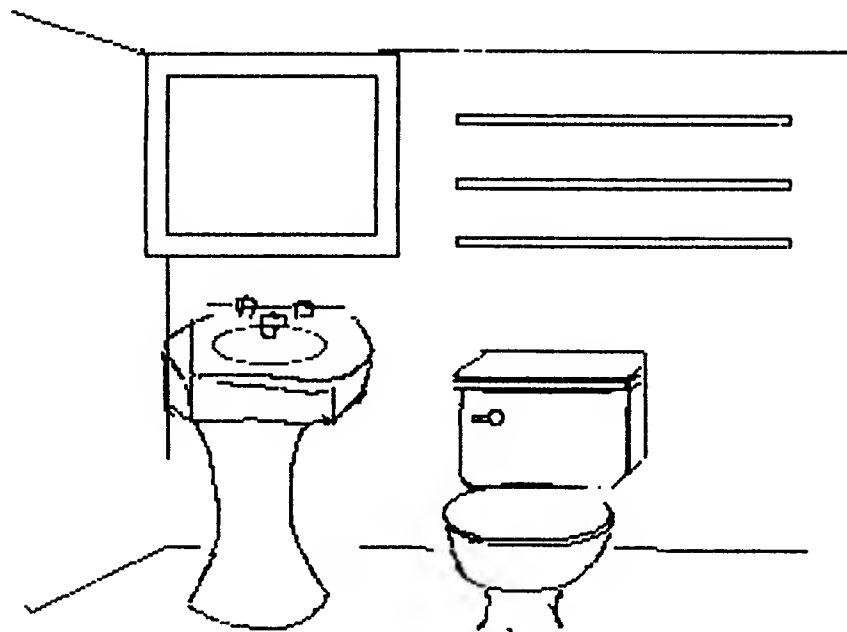
**FIGURE 4.49.** Powder Room.

The Powder Room vignette began as a rough sketch drawn on paper. A similar sketch was drawn on the screen using the PENCIL and STRAIGHT EDGE. Ceiling, wall, and floor lines were first drawn to create general perspective and to limit the scope of the drawing. The vanishing point was located by extending floor and ceiling lines until the lines met. The extended lines were ERASED after a PAINTBRUSH dot had been placed at the vanishing point. Other lines, such as the floor grid, could then use the vanishing point for reference when necessary.

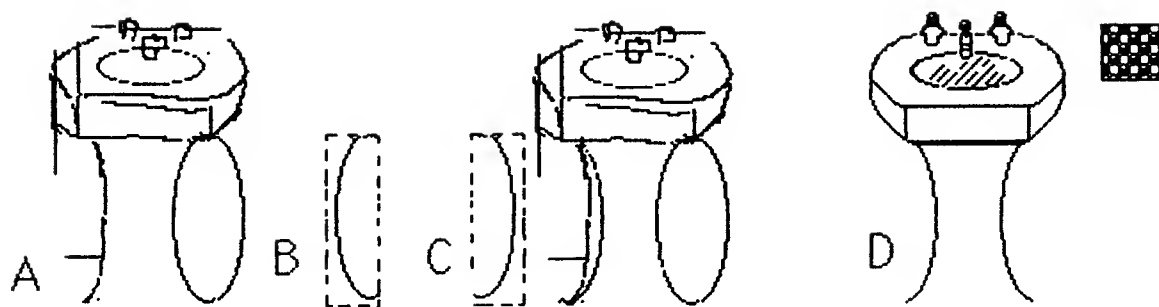


**FIGURE 4.50.** *Establishing the vantage point for the remainder of the drawing.*

Drawing from the background to the foreground, the mirror and shelves were drawn. Toilet was constructed with **HOLLOW OVALS**, **ROUND-CORNERED RECTANGLES**, and **STRAIGHT EDGE**. The sink was drawn freehand using **PENCIL**. The sink pedestal was later smoothed out using ovals that closely matched the pedestal curves (Figure 4.52 A-D).

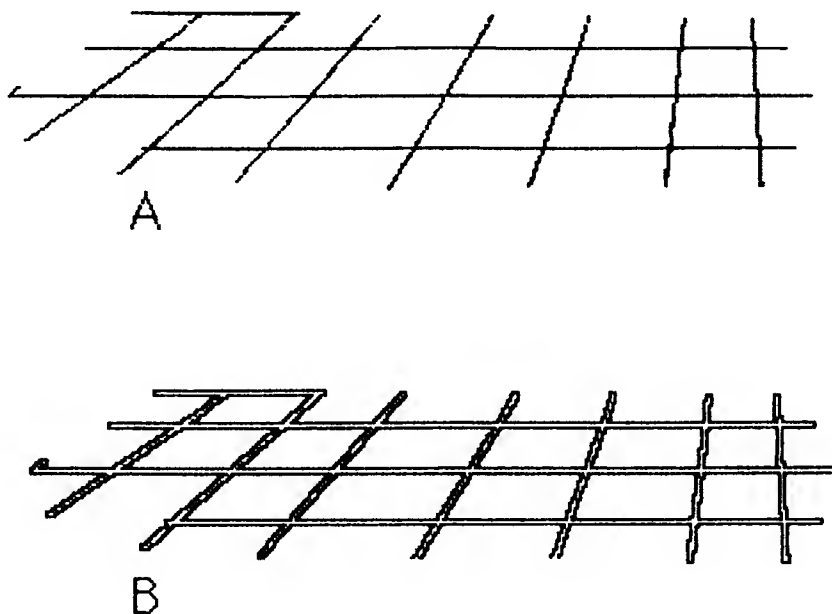


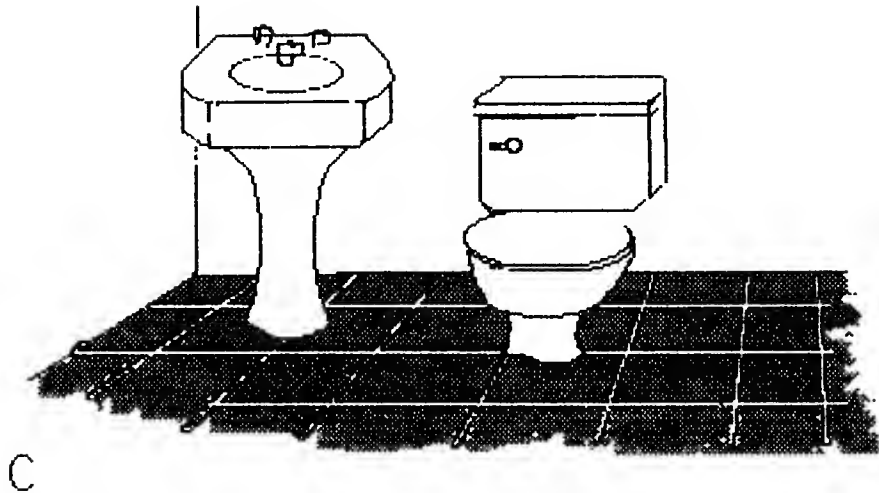
**FIGURE 4.51.** *Early development of the Powder Room.*



**FIGURE 4.52. Sink development.**

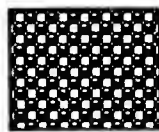
The sink and toilet were LASSED out of the picture temporarily while the flooring was installed. Flooring grid lines were drawn with the STRAIGHT EDGE and the narrow BORDER LINE WIDTH. A clear plastic ruler was hand held against the screen in line with the vanishing point. The STRAIGHT EDGE was directed along the edge of the plastic ruler creating grid lines. To give the grid lines more likeness of mortar between the tiles, the grid lines were carefully removed from the drawing using LASSO and CUT. The grid lines were then PASTED into the work area and the blinking LASSO was replaced with MARQUEE. TRACE EDGES was selected. The grid was left white and the tiles were painted using PAINT BUCKET and PAINTBRUSH. The new flooring was then LASSED and CUT onto the CLIPBOARD. SCROLLING back to the Powder Room scene, the new floor was then PASTED where the old floor had been CUT. The sink and toilet were also moved back into their places.



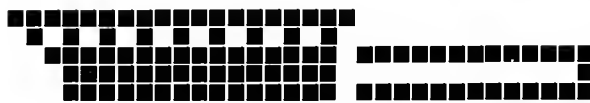


**FIGURE 4.53 A-C.** *Grid floor removed with LASSO (A). TRACE EDGES applied to the grid floor (B). PAINTBRUSH and PAINT BUCKET applied to tiles, and, fixtures returned with LASSO.*

Plant foliage was created by lightly using SPRAY PAINT and TRACE EDGES. The pots were created with the HOLLOW OVAL SHAPE. Foliage was LASSOED into the pot which let the branches hang nicely over the pot. The plant and pot were then LASSOED from the working area onto the bathroom wall and shelf. Shelves were filled with towels and powder room paraphenalia. Construction of such small details is best done in FATBITS. The marble PATTERN is also shown in FATBITS as individual marbles. When they are selected out, they make great door knobs or, as on the sink, tops of faucets. The marbles can be selected out with LASSO, or white PAINTBRUSH can be applied to erase surrounding lines, or if you know the pattern of dots, you can create them quickly in FATBITS. Shading and shadow details were added last using PATTERN and PAINTBRUSH.



**FIGURE 4.54.** *Marble PATTERN.*

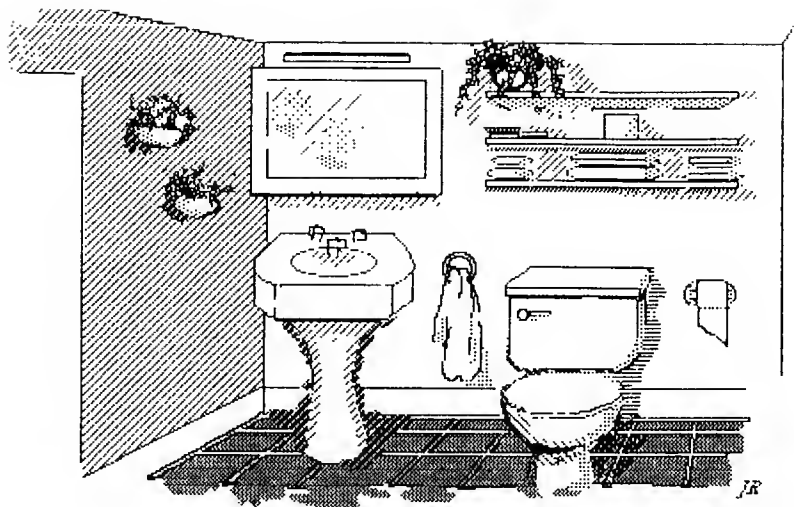


**Hairbrush Detail**



**Faucet tops Detail**

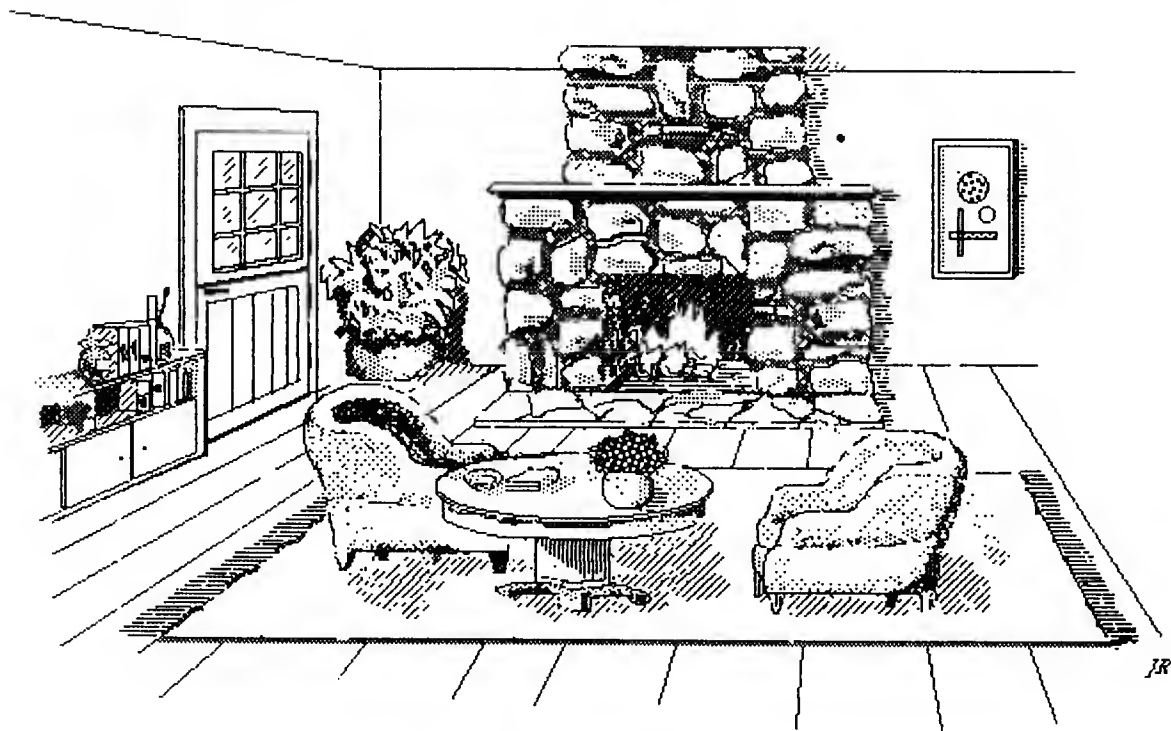
**FIGURE 4.55.** *Hairbrush and faucet tops details shown in FATBITS.*



| image   | line | border<br>line width | shape | pattern<br>texture | menu bar<br>functions |
|---------|------|----------------------|-------|--------------------|-----------------------|
| mirror  |      |                      |       |                    |                       |
| shelves |      |                      |       |                    |                       |
| sink    | <br> |                      |       |                    | <br>cut and paste     |
| toilet  | <br> |                      | <br>  |                    | <br>cut and paste     |
| plants  |      |                      |       | <br>               | <br>trace edges       |

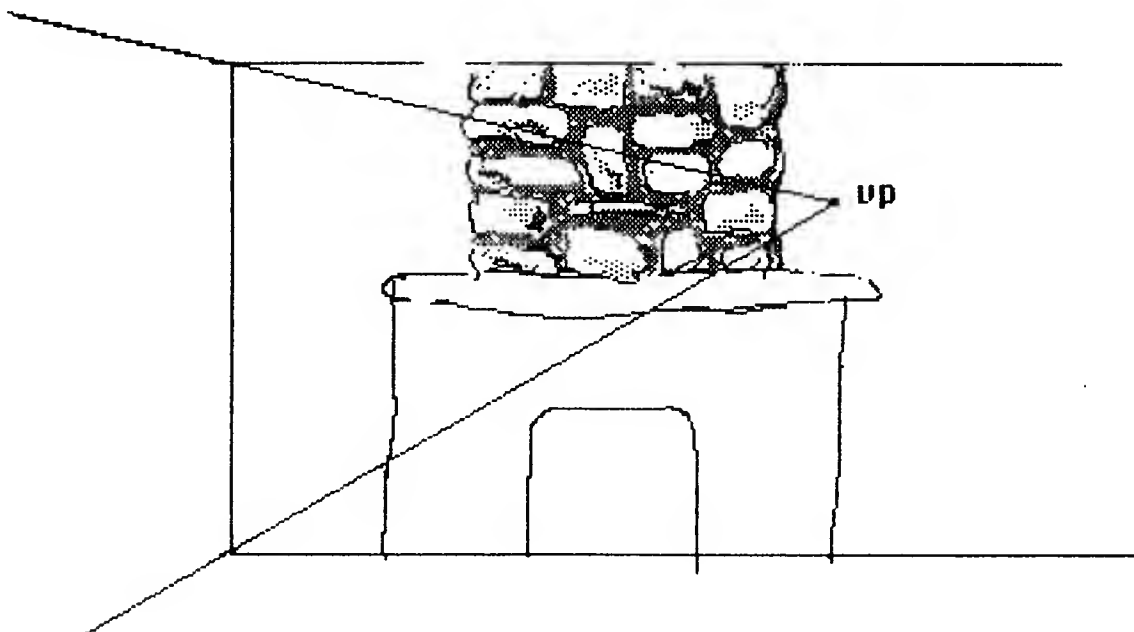
TABLE 4.1. Powder Room Development Chart.

## Reception Area



**FIGURE 4.56.** Reception Area.

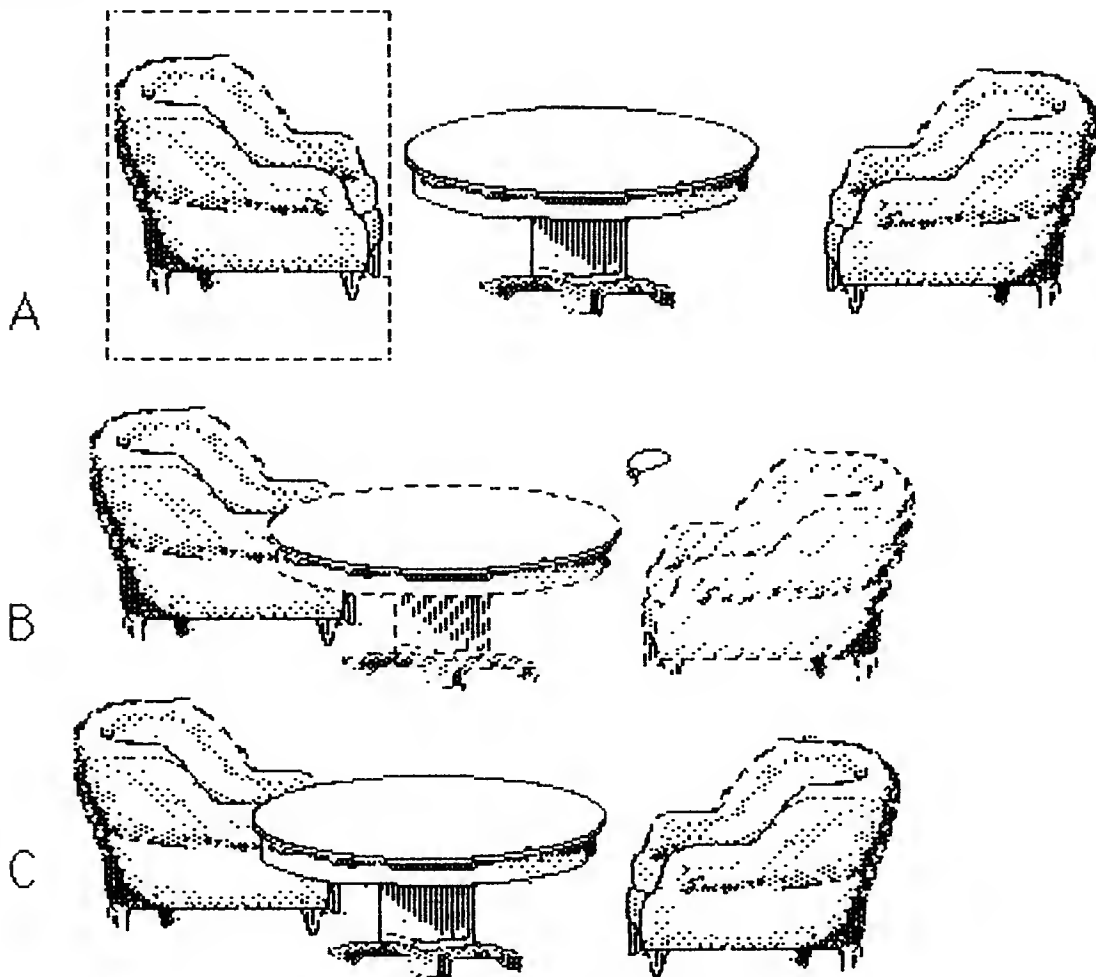
As with the other vignettes, the Reception Area was drawn from the background to the foreground. Walls and flooring were laid out with the STRAIGHT EDGE and the vanishing point determined.



**FIGURE 4.57.** Establishing the vantage point.



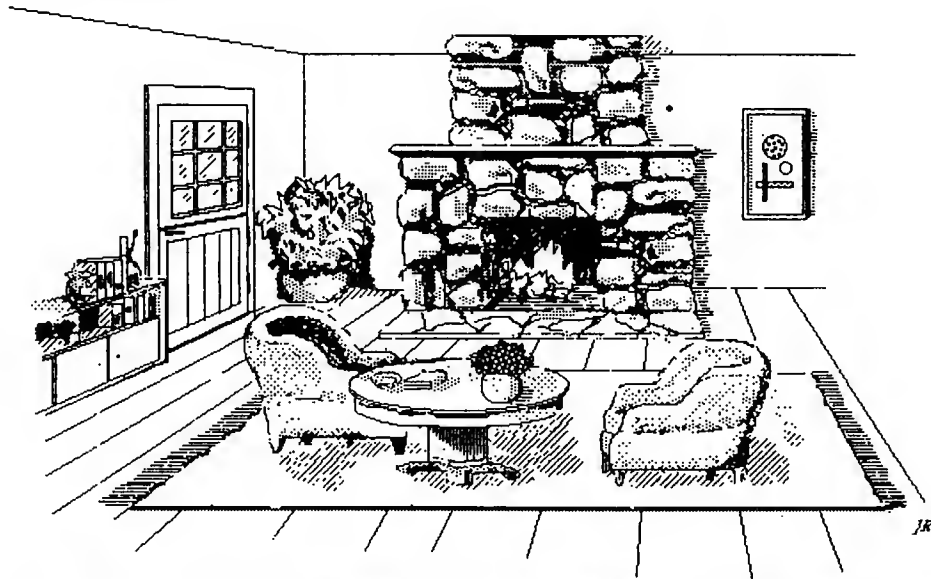
The fireplace was outlined with the PENCIL while stonework was detailed using PENCIL and PAINTBRUSH with the medium and fine grey dot PATTERNS. One chair was drawn and copied. Using MARQUEE and FLIP HORIZONTAL, the chair was turned around to face the first chair. The small conference table was drawn between the two chairs. One chair and table were then LASSED and moved to overlap the other chair. This furniture arrangement was then CUT and PASTED into the SCRAPBOOK until the room was complete with the rug and other furnishings. The chairs and table could also be used for future interior drawings.



**FIGURE 4.58 A-C.** *Developing furnishings for the Reception Area.*

Doors and shelving required use of the clear, plastic ruler to maintain lines in the direction of their vanishing point. Using the ruler against the screen is faster than extending the lines all the way to the vanishing point since this requires detailed ERASING later. Since the vanishing point is on the opposite side of the fireplace, repairing the stonework later would be time-consuming. An alternative would be to move the fireplace out of the room, like the furniture, until the room was finished. If lines are broken, in either the furniture or the fireplace, LASSING them over other lines will not conceal the unwanted lines (See transparent LASSO, page 97).

Window mullions in the door were created using TRACE EDGES around one-dot line mullions. The room was completed by drawing books directly into the shelves and adding a carpet to the floor. Carpet fringe was painted with the PAINT-BRUSH and the narrow-spaced, horizontal line PATTERN. Furniture was retrieved from the SCRAPBOOK and LASSOED into place. FATBITS were required to clean the carpet out of the chairs since lines were broken in the chairs. The drawing was finished by applying shading.



| image          | line | border<br>line width | shape | pattern<br>texture | menu bar<br>functions |
|----------------|------|----------------------|-------|--------------------|-----------------------|
| fire-<br>place |      |                      |       |                    |                       |
| chairs         |      |                      |       |                    | <br>flip horizontal   |
| table          | <br> |                      |       |                    |                       |
| bookshelf      |      |                      |       |                    |                       |
| door           |      |                      |       |                    | <br>trace edges       |

TABLE 4.2. Reception Area Development Chart.

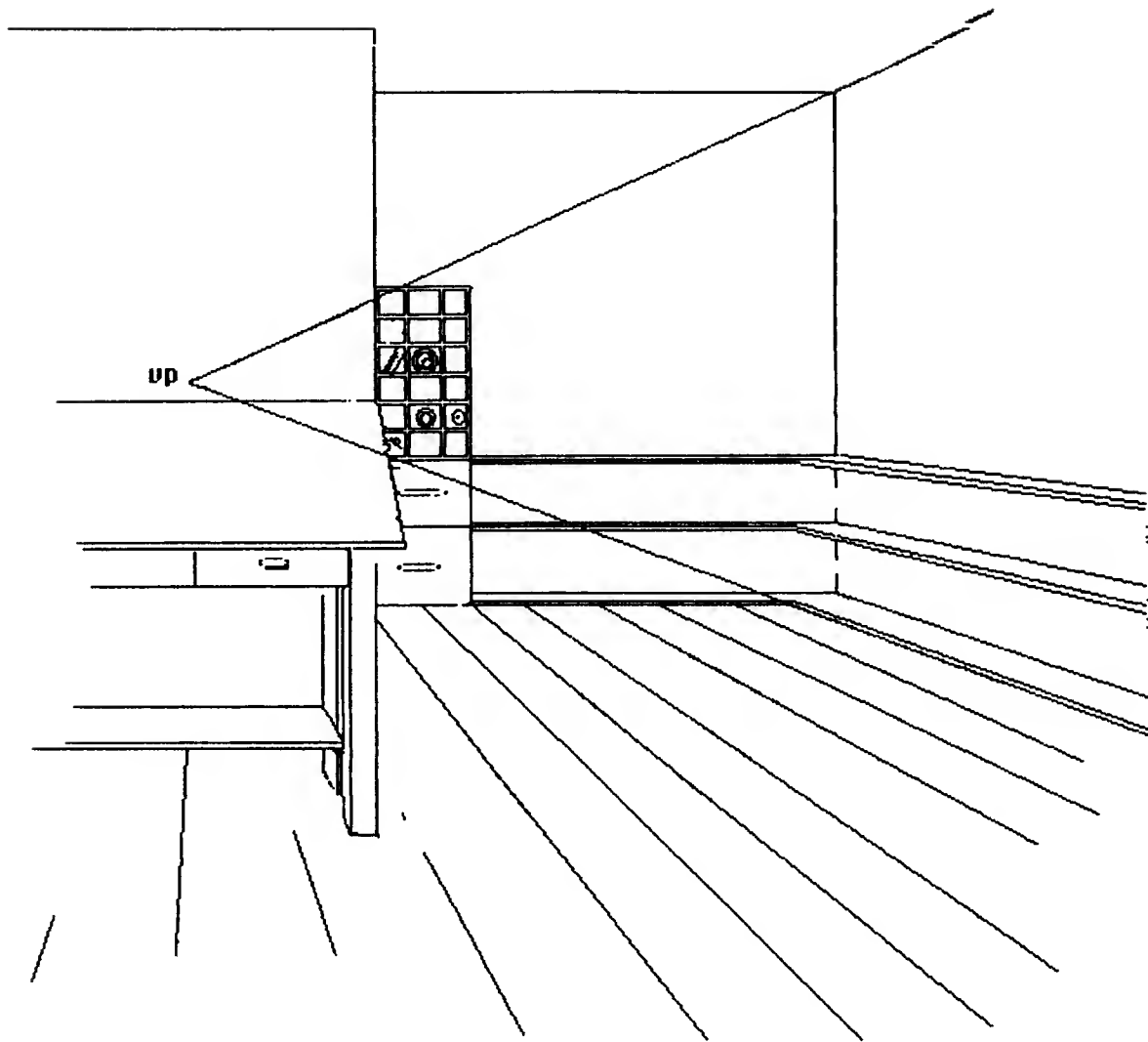
## Work Station

The final vignette was created using techniques which have been described previously. STRAIGHT EDGE was the predominant tool used.

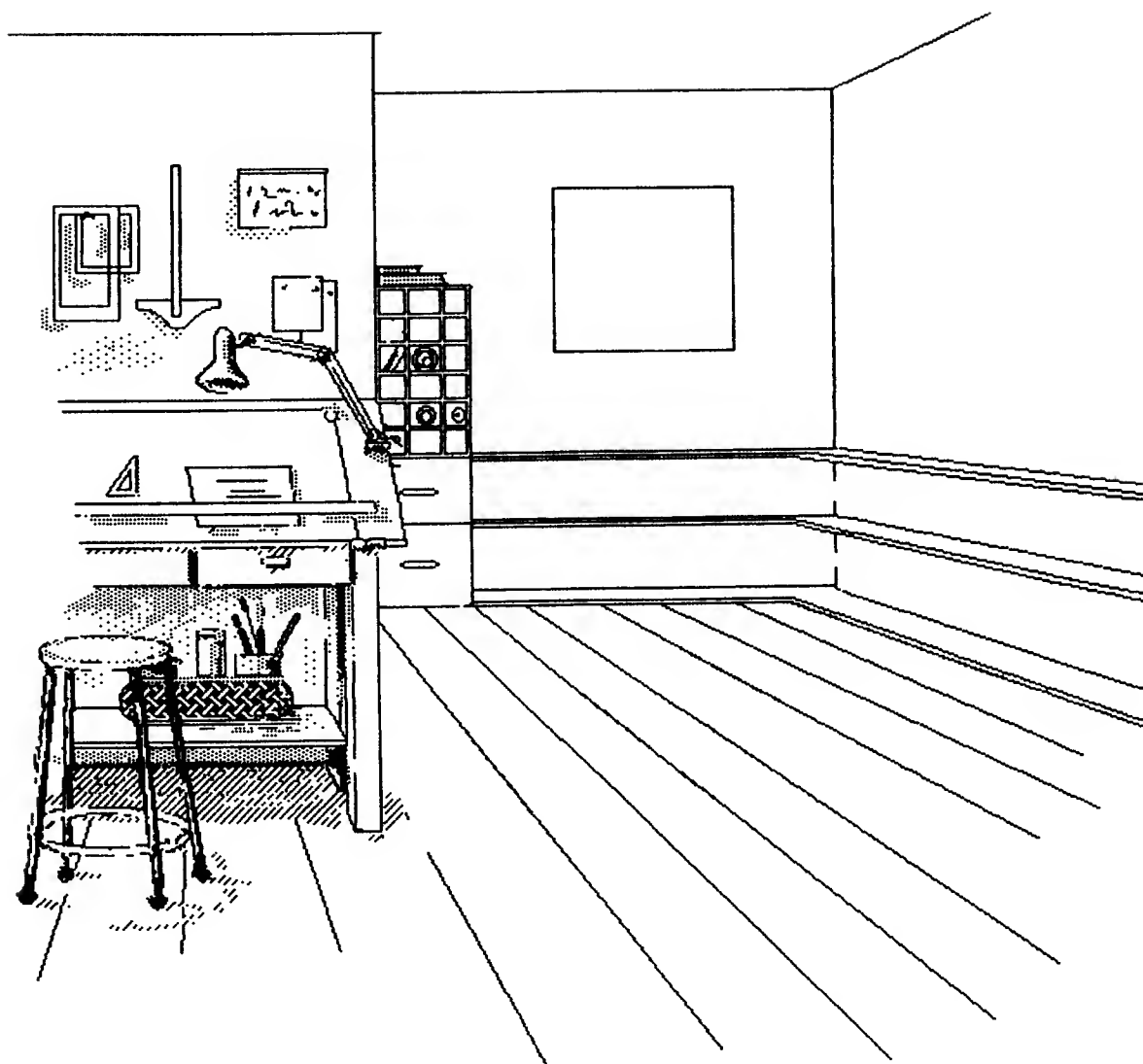
This concludes the techniques learned and resulting drawings which were developed over two months from the time I received the Macintosh. With these drawing samples, you have in hand a head start with MacPaint. In much less time, you will be creating quality, creative drawings through your explorations into MacPaint.



**FIGURE 4.59.** Work Station.



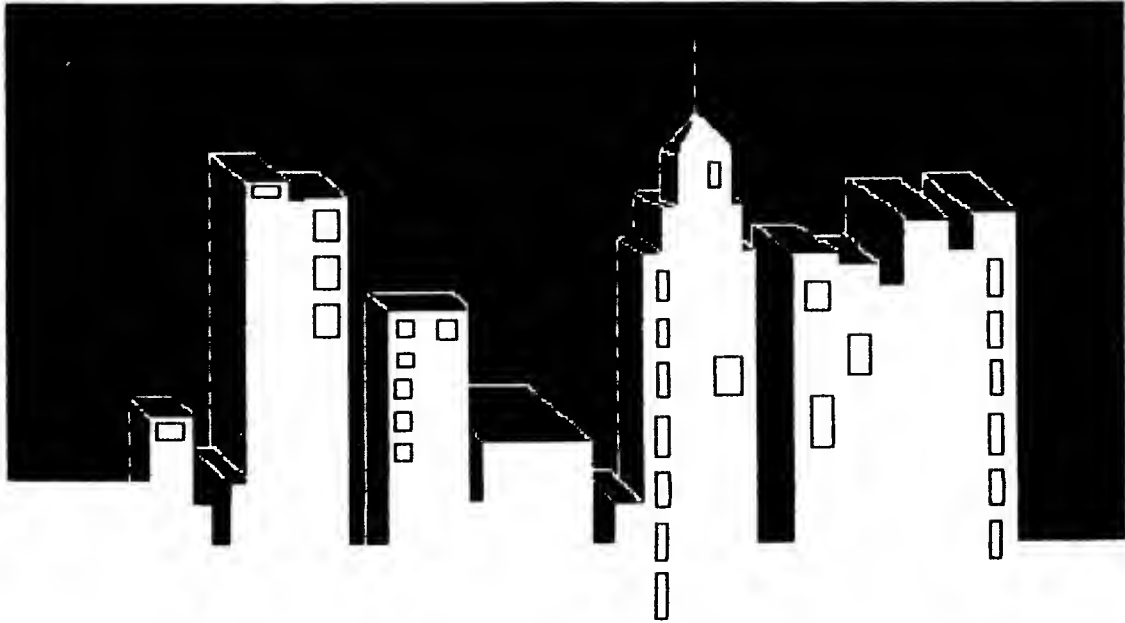
**FIGURE 4.60.** Vanishing point is established after ceiling and wall lines are drawn. The room is drawn in from the background to the foreground.



**FIGURE 4.61.** *The Work Station as details are added.*



## Chapter 5 Printer, Paper and Color

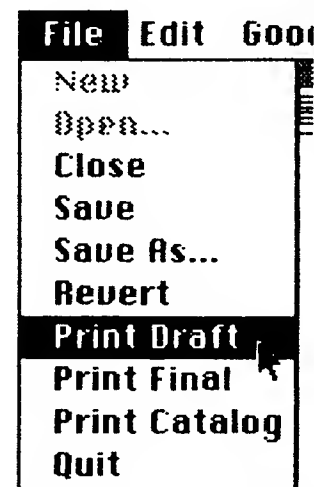


Final MacPaint drawings deserve to be presented in their best light. Printer operations, paper quality, and, if you choose, color can all have an impact on the resulting graphic presentation.

## ***Imagewriter Printer***

The Imagewriter is a dot matrix printer which can print anything you create on the Macintosh screen. MacPaint drawings are compositions of organized dots that are passed to the microprocessor in the Imagewriter. As the type head of the Imagewriter passes across the paper, it strikes the paper with a vertical column of nine wires. The nine-dot striker (wires) strikes a pattern as ordered by the image sent from the Imagewriter's microprocessor. The wires may strike the paper as many as 10,240 times in one pass across the paper. The manual provided with the Imagewriter is very good and provides much technical information. Provided here are some guidelines to quality printed graphics and how to make the best use of the printer in daily tasks.

To print a MacPaint document, turn on the Imagewriter. The power light will be green. Make sure the paper, either pin fed or single sheet, is in place. The select light should also be green unless you want to line feed or form feed the paper. Choose PRINT DRAFT or PRINT FINAL from the FILE menu. When PRINT FINAL is selected, the type head on the printer passes over the drawing twice, creating a darker image. When your ribbon is fresh, PRINT DRAFT produces a quality printout in less time. Within minutes you will have the entire document on paper.



**FIGURE 5.1.** *Print document contents from the FILE menu.*

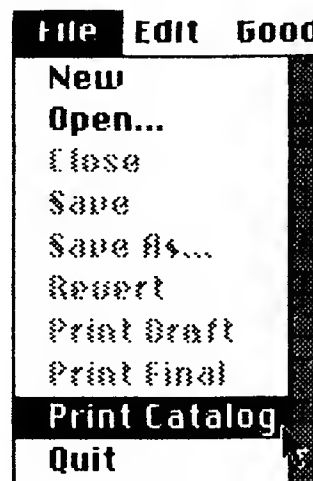
You will find that printouts of your drawings are not as clear as the image on the Macintosh screen. There are two reasons for this. First, printout results from the Imagewriter are slightly larger than what you actually see on the screen. This makes the screen resolution higher and improved over what is printed on paper. Secondly, as you have seen in FATBITS, dots are actually square in MacPaint. The Imagewriter's striker wires, however, transfer images as round dots rather than square dots. This can lead to fuzzier edges or tiny gaps where the round dots don't quite fill in on the printer paper. Both of these facts account for the screen images being clearer than printouts from the Imagewriter.

With printing being so easy, you will find it convenient to print your drawing at any stage of development without disruptions. In fact, it is recommended that you do print frequently when your drawing occupies more than one window.



Frequent printing lets you see in detail where you are on a full page drawing which is not possible when viewing parts of the drawing from the screen. As a drawing is being developed, the printouts will show what details need to be emphasized or toned down. I have also found it advantageous to begin a drawing on MacPaint, print it, and sketch the drawing further on the printout before returning to the screen to complete the drawing with MacPaint. You will find that the Imagewriter can help you with as much of your work as MacPaint's icons.

Imagewriter will also print the diskette directory from MacPaint. Select PRINT CATALOG from the FILE menu.



**FIGURE 5.2.** Print diskette contents from FILE menu's PRINT CATALOG.

This tells you what documents you have on the diskette currently in the Macintosh disk drive. The name of the disk, the name of each document, and little postage stamp drawings appear on the printout. The catalog printout actually shows the drawings which are stored on that particular diskette. The details are not clear, but you can see drawing development in each of the catalog pictures. When you begin to accumulate many diskettes of drawings, you will find this printout invaluable for locating a particular drawing.

MacPaint documents on disk point4

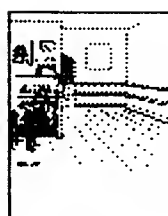
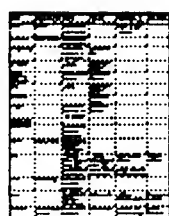


figure 4.61



APPENDIX A



CHAPTER 5



CHAPTER 4



CHAPTER 1



CHAPTER 2



CHAPTER 3



top of table 4.2

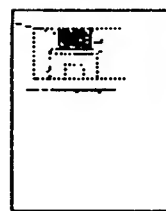


figure 4.57

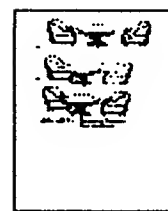


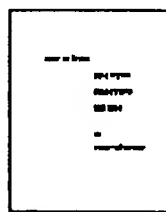
figure 4.58



figure 4.59



figure 4.60



title page

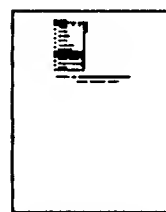


figure 5.1

**FIGURE 5.3. Printed catalog.**

Something you may need to do from time to time is send the entire screen contents to the printer. The entire screen includes icons, BORDER LINE WIDTH palette, PATTERNS, and title bar. To do this:

1. Turn on the printer.
2. Press **CAPS LOCK** on the keyboard.
3. Press the **SHIFT** key, the **COMMAND** key, and the number 4 key, all at the same time, then release.

This is called a “screen dump”. Figures in Chapter 1 were screen dumps. To save a screen dump on the diskette follow the above procedure but press the number 3 key instead of the number 4 key. This will be saved on the diskette as SCREEN 0. Screen dumps saved to the diskette will be numbered consecutively, 0-9. To add more than ten screen dumps to the diskette, you need to rename the earlier screen dump documents.

Screen dumps saved on diskette can be treated just like any other MacPaint document. You are able to draw new information into the screen dump or LASSO any of the icons or palette information into other documents. Since images on the screen are smaller than those printed, an image in a printed screen dump will be smaller than if you had printed it normally.

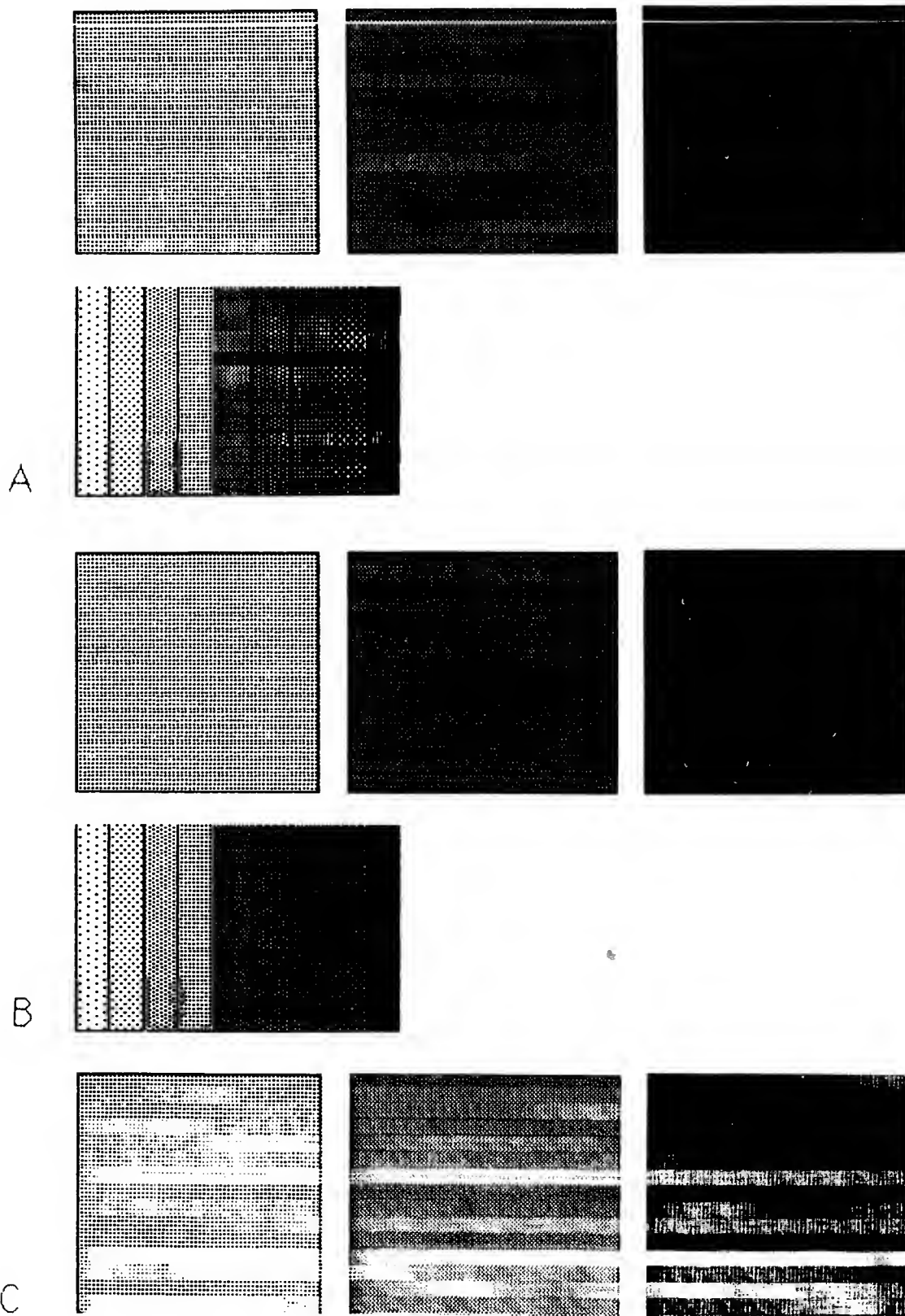
## ***Paper and Ribbon***

After spending time creating your work of art, your drawing deserves the best printed presentation possible with Imagewriter. Keeping a fresh ribbon handy for the final graphics to be presented will help keep the artwork looking sharp with good black and white contrast. Paper quality also affects the results. Examine Figure 5.4 A - C which shows various patterns printed on three types of paper. Poor quality paper on the pin feed does not run through the printer as smoothly as is possible on more expensive tractor feed printers. There is some overlapping of the striker wires causing horizontal ghost lines. This is especially noticeable in larger, darker portions of print. Using higher quality paper of heavier weight will minimize the horizontal ghosting, especially when friction fed one sheet at a time. If you can afford the luxury of printing on Grumbacher's new Maxima ledger paper, try it for your final drawings. This 32 pound medium weight paper is intended for paste-ups and typed copy. Results are superior to any other papers I have tried. A tablet holding 50 sheets (9" x 12") costs about \$3.50 and is worth it for those presentation quality drawings.

Figure 5.4 A shows what can happen from time to time when using the pin feed mechanism. Irregular motion of the pin feed mechanism can cause white stripes through the drawing. When using continuous pin fed computer paper, the perforated folds of the paper can stick momentarily under the light-weight, metal roller shaft. This will also cause a line of print to be missed leaving a white line as in Figure 5.4 A. For final copy of your graphic art work, you will have better results using friction feed printing and single sheets of paper.

When there are large areas of dark print, you can have some smudging on lower quality paper when a new ribbon has been installed. This problem does not go away until your ribbon has made a complete cycle or you use better quality paper.

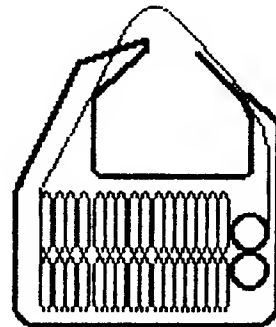
The problem in Figure 5.4 C results from the ribbon not moving ahead properly. It may be that the ribbon cartridges was too tightly packed at the factory. If the problem continues even after manually winding the ribbon ahead, return the ribbon to the dealer.



**FIGURE 5.4 A-C.** Printer results on pin fed, 20 pound computer paper (A). Results on parchment deed paper, 100% cotton fiber, and friction fed (B). A poor ribbon prints poorly on any quality of paper (C).

There is quite a variety in ribbons. Three things I look for in a ribbon is color, price, and how well the ink stays on the paper. Color of the ribbon's ink can vary from dark blue to black. It has been my experience that the black inked ribbons smear more easily than the bluish ribbons. For some reason, a good black ribbon, which doesn't smear during the printing process or after taking the drawing out of the printer, is expensive. Prices of ribbons range from around \$3.00 to \$11.00. Keeping less expensive ribbons for draft work and \$11.00 ribbons for final printing is the most economical choice.

Figure 5.5 shows how the ribbon is packed into the cartridge. There are approximately sixteen yards of ribbon packed into the cartridge. The second time the ribbon cycles through the cartridge, there is a noticeable but not objectionable difference in the intensity of ink printed. With some of your graphics you will find the ribbons second cycle to be its best. Thirty-two yards later when the ribbon is travelling past the striker wires for the third time, the print has faded considerably. This is usually the time I replace the ribbon. Before you toss your ribbon out, open it carefully and look at how the ribbon is packed. Turn the knob, too, and watch it move through the cartridge.



**FIGURE 5.5.** Over 16 yards of ribbon serpentine the 4-1/4" cartridge.

Printing on other types of paper, vellum, mylar, tracing paper, or textured art papers produces adequate results. If paper is quite light weight, as tracing paper is, there must be heavier paper backing the light weight paper. When putting tracing paper through friction feed, the paper has a tendency to tear during printing if the paper's edges are not smooth and free of tears initially. With care, however, good printing results are obtained on tracing paper which may be important for blue line printing or black line diazo printing in reproduction work.

## ***Reproducing Drawings***

If you have been accustomed to printing your drawings as blue prints or black line prints, you will not be disappointed in the results of Imagewriter's printouts for reproduction work. Drawings printed on vellum, mylar, or white tracing paper reproduce clearly when run through a blue print or diazo machine. This presents tremendous opportunities for design firms to store working drawing details in MacPaint. The details can be printed on vellum, mylar, or tracing paper, and pasted onto a larger drawing to be reproduced later.

If printing or reproduction results are not satisfactory it may be the graphics were unclear before leaving MacPaint. There are some PATTERN combinations which do not reproduce as well as others. A white dot pattern which is surrounded in black dots can be difficult to read when reproduced, especially if used only



in small areas. Examine the PATTERN palettes of the screen dumps in earlier chapters. When comparing the illustrated palette to the screen's PATTERN palette you will have an indication of patterns that reproduce well. Running printed PATTERN combinations through a xerox copy machine can reveal which pattern combinations work the best. Too many light doses of SPRAY PAINT can also weaken otherwise strong graphics. Experience is the best way to find what patterns and textures work well in your graphic applications.

## ***Color***

Designers and artists work with color to create illusions and mood. Color provides additional information about the world around us more quickly than if we lived in a monochromatic world. However, MacPaint does not offer color. But the beauty and variety of markers and colored pencils cannot be matched by Macintosh and any plotter needed to print color graphics.

Macintosh graphics can be enhanced by using Magic Markers, Niji Markers, Prismacolor Berol Markers and Prismacolor Berol pencils. Ad Markers and Design markers were also tried on MacPaint drawings on computer paper but these markers tended to bleed and run on computer paper. Quality of ink in the ribbon can affect the results of color markers. Less expensive ribbons may not have high quality ink which tends to smear and run when markers are applied. A marker fixative that minimizes color and ink bleeding can be applied before you color the printouts. Such a fixative will also add tooth or roughness to smooth papers, making color pencils easier to apply and more effective. I think you will agree that adding color can put the final touch to MacPaint drawings for the design professional in an office or the three-year old at the kitchen counter with a first MacPaint coloring book.

## Appendix A Icon Chart

| ICONS                    | DOUBLE CLICK          | SHIFT   | OPTION   | COMMAND ⌘  | BACKSPACE               |
|--------------------------|-----------------------|---|--|--|-------------------------|
| Pencil                   | FatBits               | horizontal & vertical line  |  | enter or exit FatBits                                      |                         |
| Paintbrush               | Brush Shapes          | horizontal & vertical line  |  |  |                         |
| StraightEdge             |                       | horizontal, vertical, & 45° angles  | patterned line   |  |                         |
| Rectangle                |                       | square  | patterned border   |  |                         |
| Round Cornered Rectangle |                       | round corner square   | patterned border   |  |                         |
| Oval                     |                       | circle  | patterned border   |  |                         |
| Freeform                 |                       |   | patterned border   |  |                         |
| Polygon                  |                       | horizontal, vertical, or 45° angles   | patterned border   |  |                         |
| Paintbucket              |                       |   |  |  |                         |
| Spray Paint              |                       | horizontal & vertical directions  |  |  |                         |
| Eraser                   | clears screen         | horizontal & vertical directions  |  |  |                         |
| Text                     |                       | + Option + Tilde/Accent Key  = Mac's secret characters | + Shift + Tilde/Accent Key  = Mac's secret characters | +⌘ or ⌘ = Font change<br>+ Shift +⌘ or ⌘ = FontSize change | erases letters          |
| Scroll                   | shows page            | horizontal & vertical directions  |  |  |                         |
| Lasso                    |                       | horizontal & vertical directions  | makes copy   | + Option = multiple copies                                 | erases Lasso contents   |
| Marquee                  | selects entire screen | horizontal & vertical directions  | makes copy   | enlarges or reduces image                                  | erases Marquee contents |





## Appendix B Increasing Diskette Storage

If you use MacPaint directly from the store without some modifications to the diskette, you will not have enough room to save many of your drawings. Offered here are some tips and first steps you should take to get the most available storage space on your MacPaint diskette.

1. First, create a backup diskette of your new MacWrite/MacPaint by double clicking over the DISK COPY icon on the Macintosh desktop - Figure B-1. Follow the screen instructions. Put your original MacWrite/MacPaint diskette away in a safe place.

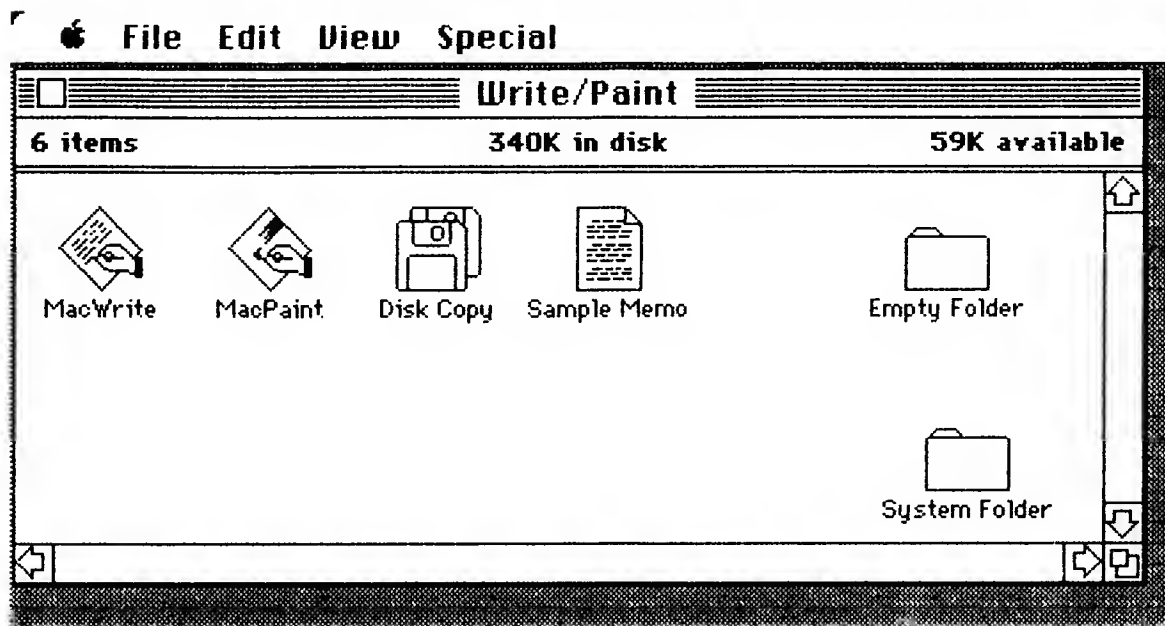
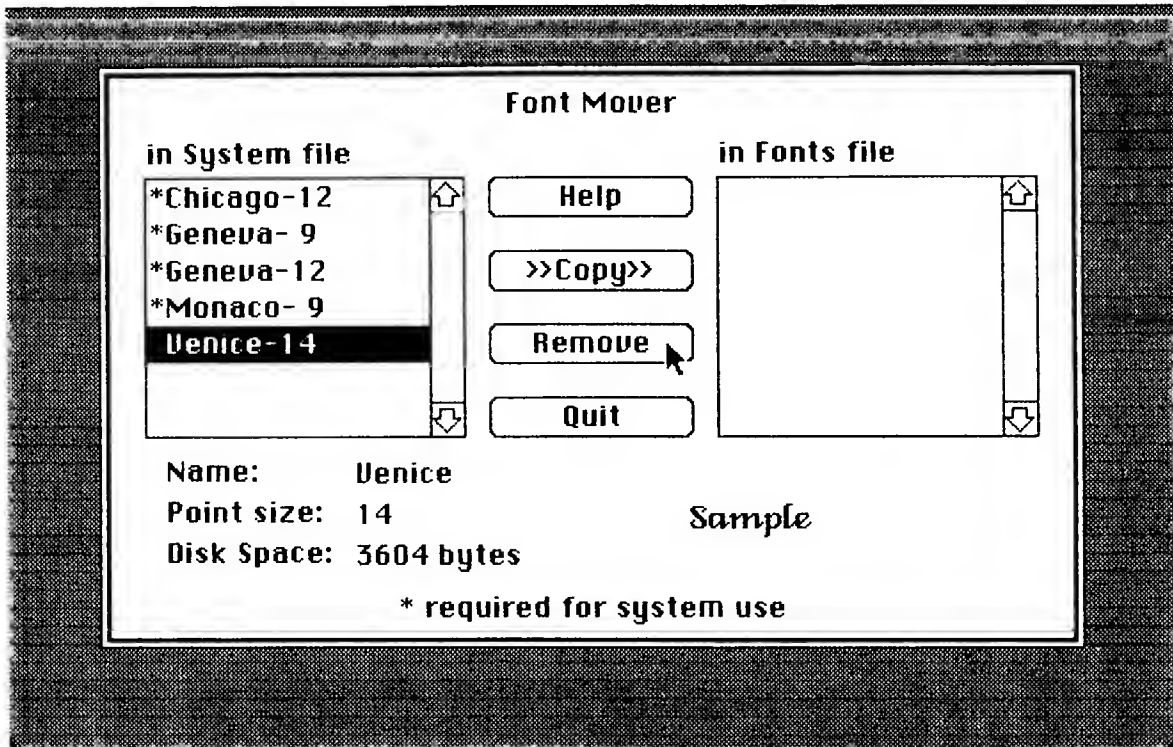


FIGURE B-1. Macintosh desktop of a new MacPaint/MacWrite diskette.

2. With your backup MacWrite/MacPaint diskette in the drive, drag the DISK COPY and MACWRITE to the trash can. Select EMPTY TRASH from the SPECIAL menu.
3. With your Macintosh system there is also a System diskette. This diskette serves as a housekeeper to other diskettes. EJECT (from the FILE menu) your MacPaint diskette and insert the System diskette.
4. System diskette has an icon labeled FONT MOVER. Select FONT MOVER and drag it over to the MacPaint icon. The system will now copy the FONT MOVER onto the MacPaint diskette. Just follow the screen instructions and swap the two diskettes back and forth.

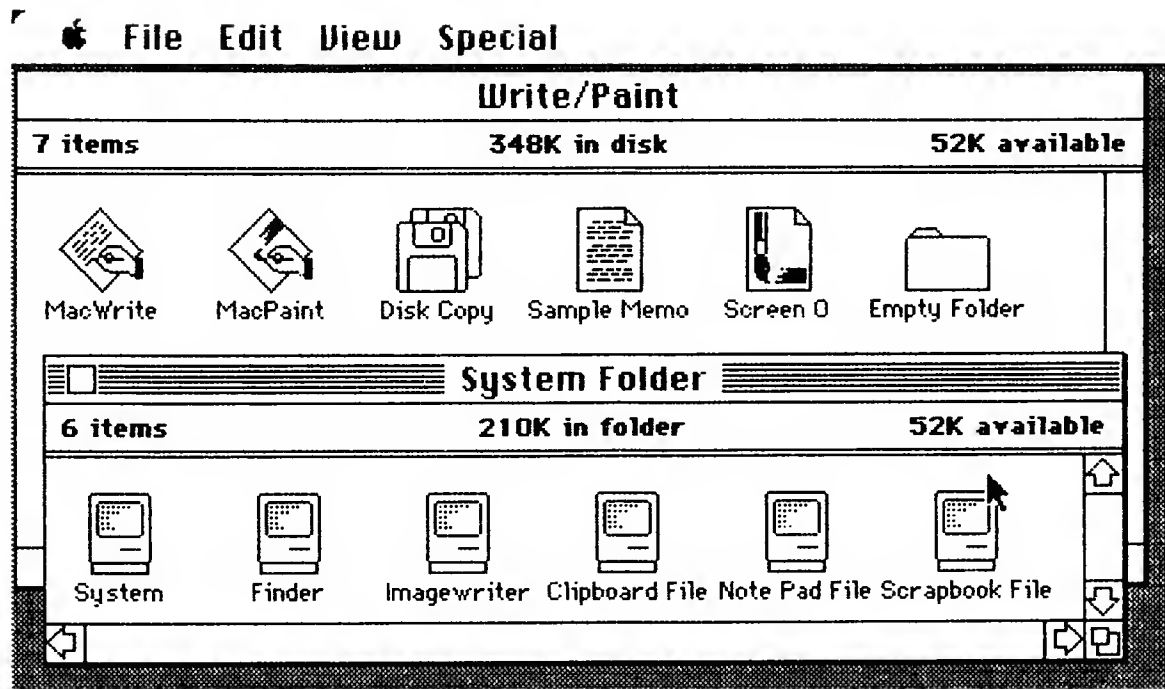
5. **EJECT** the System diskette if it is still in the drive and insert the MacPaint diskette. Select **FONT MOVER** by double clicking the icon.
6. A dialogue box will appear on the screen as shown in Figure B-3. **REMOVE** those fonts which you are unlikely to use. Those fonts with an asterisk cannot be removed.



*FIGURE B-2. Dialogue box used to delete FONTS from MacPaint diskette.*

7. Select **QUIT**. When you have returned to the desktop, **TRASH** the **FONT MOVER**.

All that you need on MacPaint is **MACPAINT**, **EMPTY FOLDER**, and **SYSTEM FOLDER**. Inside **SYSTEM FOLDER**, as shown in Figure B-3, are the minimum files required to operate MacPaint. If you operate MacPaint with these bare minimum essentials you will have 188K available for storing your drawings.



**FIGURE B-3.** Files that must be included with MacPaint are stored in the **SYSTEM FOLDER**.

While using MacPaint, if you keep the SCRAPBOOK, and NOTE PAD clear of unnecessary drawings, this will also save you storage space. Keep in mind that if a document is 12K, it will require 24K of available storage while you are working on that drawing. The quilt patterns in Chapter 3 are over 40K. There must be nearly 90K available on the diskette while working on a document of that size.

These steps will ease the frustration of diskettes filling up too quickly. But nothing eases that pain quite as well as a second disk drive, a decision you may make sooner than you had planned.



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*Prepublication reviewers say...*

*"Very impressive! This book combines many useful methods for producing quality graphics—rapidly and easily! This will be an extremely useful book!"*

*"Readers will love this book! It's like learning to paint with a patient, clever, friendly instructor at your side!"*

## **MACPAINT** **DRAWING DRAFTING DESIGN**

Susan Schmieman

Create your very own masterpieces with MacPaint, Apple Computer's graphics program! Both novices and experienced Mac users can discover the magic of drawing with the help of this easy-to-read, well-organized guide fully packed with clear, imaginative illustrations. This book teaches you one step at a time... and builds your knowledge and experience in logical, understandable increments. With the help of attention-grabbing examples and fun-filled exercises, you'll explore a new world! Begin by learning the basic definitions and tools used by MacPaint and advance to generating your own ideas for design projects! Whether you're a beginner learning to draw an alley cat or an advanced user who needs help drawing a floor plan, you'll succeed with the help of this enthusiastically written book!

The basic tools you'll learn to use include:

- Lines, shapes, and patterns
- Erasing
- Lassoing and marqueeing
- Window screen and menu bar functions

Design projects include:

- |             |                                     |
|-------------|-------------------------------------|
| • Girl      | • Drawing to scale                  |
| • Shapes I  | • Overlay mapping                   |
| • Alley cat | • Detailing                         |
| • Shapes II | • Highlighting                      |
| • Flowchart | • Floor plans                       |
| • Quilting  | • Elevation and perspective drawing |

## **CONTENTS**

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